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AN EXPERT SYSTEM MODEL OF ORGANIZATIONAL
CLIMATE AND PERFORMANCE

A Dissertation

by

JAMES RICHARD HOLT

Submitted to the Graduate College of
Texas A&M University
in partial fulfillment of the requirements for the degree of
DOCTOR OF PHILOSOPHY

August 1987

Major Subject: Industrial Engineering



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ABSTRACT

An Expert System Model of Organizational Climate and Performance.

(August 1987)

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M.S., Air Force Institute of Technology

Chairman of Advisory Committee: Dr. James K. Hennigan

Application of computer technology has greatly increased the manager's ability to make informed decisions about inanimate resources (e.g., money, materials, equipment, space and time). However, very little has been done to automate decisions involving human behavior because of the complexities involved.

This research uses a third generation expert system development shell to create a prototype management consultant for behavioral issues. The frame-based, object-oriented expert system represents individuals and organizations in a decision support system. The expert system allows managers to make real time inquiries about the effect of changes in individual attitudes in specific organizations upon organizational performance.

A survey questionnaire is developed to measure 133 individual attitudes. Selected organizational behavior and group dynamics findings are translated into 52 production rules. The rules are written as methods which are activated by the system following the structure of current behavioral models to predict performance.

✓ The system is validated by situational analysis. Individual attitudes are adjusted using fuzzy logic algorithms in 18 different situations, and the changes in calculated performance are compared with managers' predictions. Statistical analysis shows it is possible to predict changes in performance due to changes in attitude and circumstances.

*Keywords: data argumentation,
computer programs. (K&A)*

↑

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INTRODUCTION: RESEARCH OVERVIEW

Nature of the Problem

Managers make daily decisions on the use of resources in their organizations. Decisions about inanimate resources (e.g., money, material, equipment, space and time) are frequently automated to optimize performance of the resources. However, without consideration for human resources which pervade the organization, overall performance may be suboptimal.

Recent reductions in the cost of computer systems and advances in hardware and software provide managers ready access to powerful computer equipment. Complex problems can be solved easier than ever. Programs help schedule, forecast, simulate, evaluate, predict and inform so the manager can make enlightened decisions. But, these programs do not consider the behavior of the humans involved when evaluating problems.

Behavioral issues are among the more complex problems a manager will face. And yet, there are few tools to evaluate the complex interactions and predict their effect on performance. This is an area where clever application of programming power could provide significant benefit to increasing human performance. Much is known

This research follows the Human Factors journal style.

about the effect of interpersonal relations, the values of good standards and goals, the importance of the communication system, the impact of work surroundings, the hazards of organizational stress and other environmental factors on individuals. But there is still considerable ambiguity, uncertainty and even conflict in the study of behavioral issues. Before human behavior decisions can be automated, several questions must be answered:

What are the important measures of human behavior?

How are they related?

How do they contribute to performance?

How do you deal with ambiguity, uncertainty and complexity?

How can the results be validated?

Research Purpose

This research addresses the problems associated with automating decisions based on human behavior and creates a prototype expert system which predicts performance based upon individual attitudes and organizational climate. The resulting expert system is a management consultant to help managers make informed decisions about behavioral issues.

The prototype demonstrates how a third generation expert system development shell can be used to represent the complexity in organizations. Important behavioral attitudes are measured and their interactions are evaluated by behavior rules drawn from known

research findings. These preliminary rules predict the contribution of individual attitudes towards organizational performance.

The consultant is a decision support system which combines organizational theory with current computer technology to provide advice in areas of important management responsibility. The consultant can evaluate "what-if" options and help managers make informed decisions. Use of this type of consultant can identify organizational problem areas and improve operational performance.

RESEARCH BACKGROUND

This section reviews the development of behavior theory and representative models of organizational behavior, group dynamics and management theory developed by researchers. It also reviews the history and progress of expert systems within the study of artificial intelligence and summarizes how knowledge is represented and used in an expert system.

Behavior Theory

The development of modern behavior theory began with formulation of the scientific management approach at the end of the nineteenth century. Scientific management presumed there was "one best way" to do any task. With this philosophy, it was management's duty to find that best way and train the right person to do the task (Kast and Rosenzweig, 1974).

The human relations movement began early in the twentieth century. Behavior research found that social situations, worker motivation and job satisfaction influenced production (Roethlisberger and Dickson, 1939). Since those early findings, literally hundreds of studies have shown innumerable interrelationships among people, attitudes, policies and working conditions (see nearly 1200 references in Secrist, 1969). The enormous number of findings prompted researchers to group or structure similar findings into models of organizational behavior.

Behavior Models

This section includes several different views of organizational behavior and performance.

Kast and Rosenzweig. Kast and Rosenzweig (1974) display the overlapping responsibilities of management as intersecting systems on a Venn diagram (see Figure 1). Arrows indicate input and output flows of information, effort and materials across system boundaries. Each system interacts with other systems and the environmental

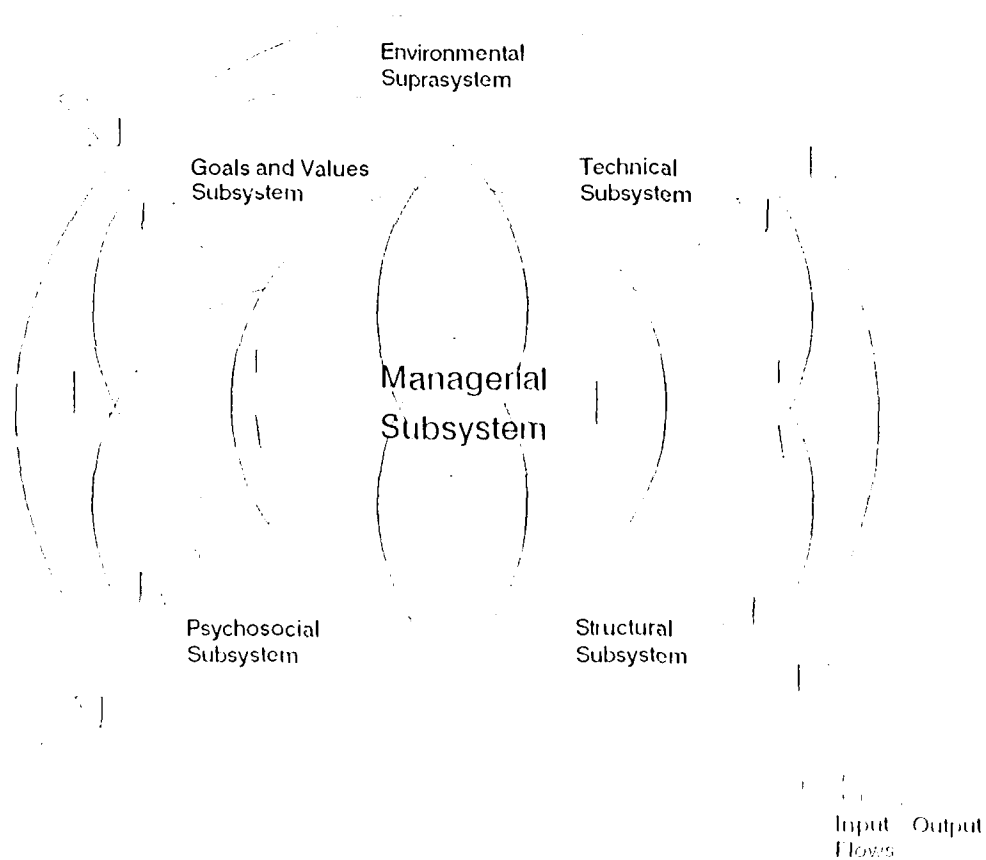


Figure 1. Representation of organizational systems (Kast and Rosenzweig, 1974).

suprasystem. The managerial subsystem takes the central role in balancing flows across system boundaries.

Sutermeister. Figure 2 displays many of the contributing factors which Sutermeister (1969) felt influenced individual performance and organizational productivity. Each element on the tree is combined with other elements which in turn contribute, in successive degrees, to the final measurement.

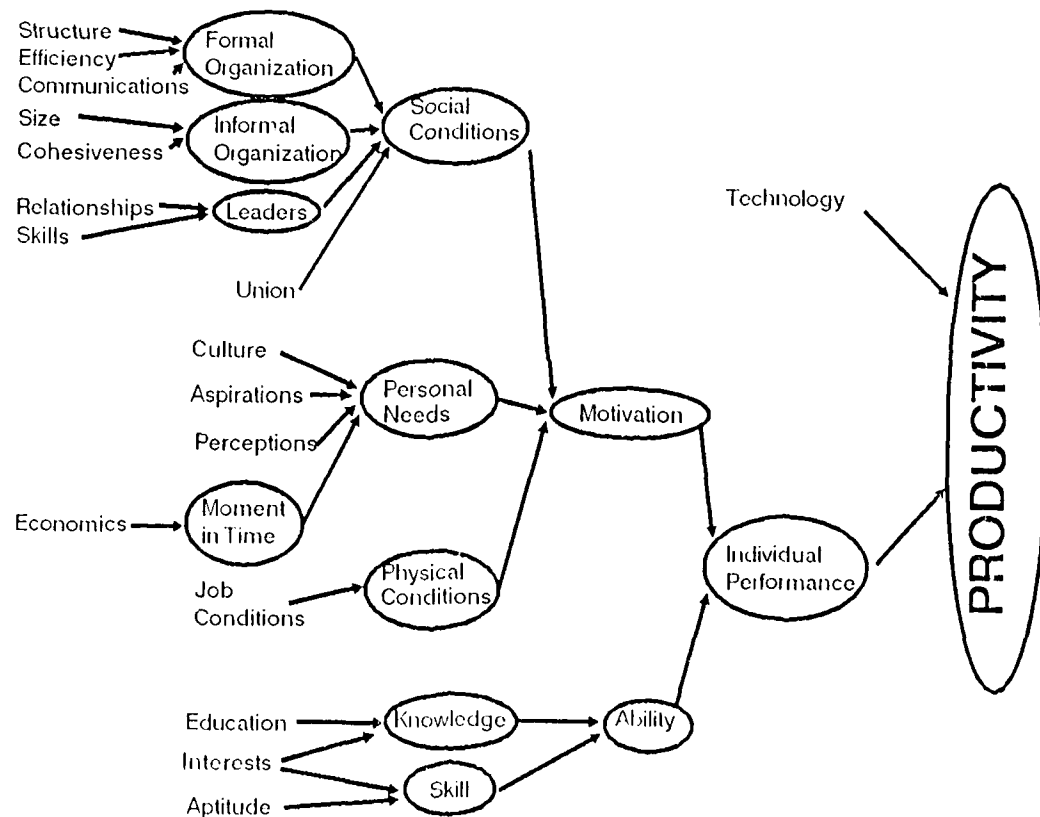


Figure 2. Major factors affecting productivity (Sutermeister, 1959).

Katz and Kahn. In the role episode model developed by Katz and Kahn (1966), role expectations are assigned to each position in the organization (see Figure 3). When a person (a role sender) attempts to influence another person (focal person), the actions of the sender describe a "sent role." The focal person's perception of the sent role is the "received role" and the response to the sent role is the "role behavior." These interactions are tempered by the attributes of the two individuals and their interpersonal factors. The role behavior (or results of the role sender's action) then contributes to the new organizational situation and affects organizational factors.

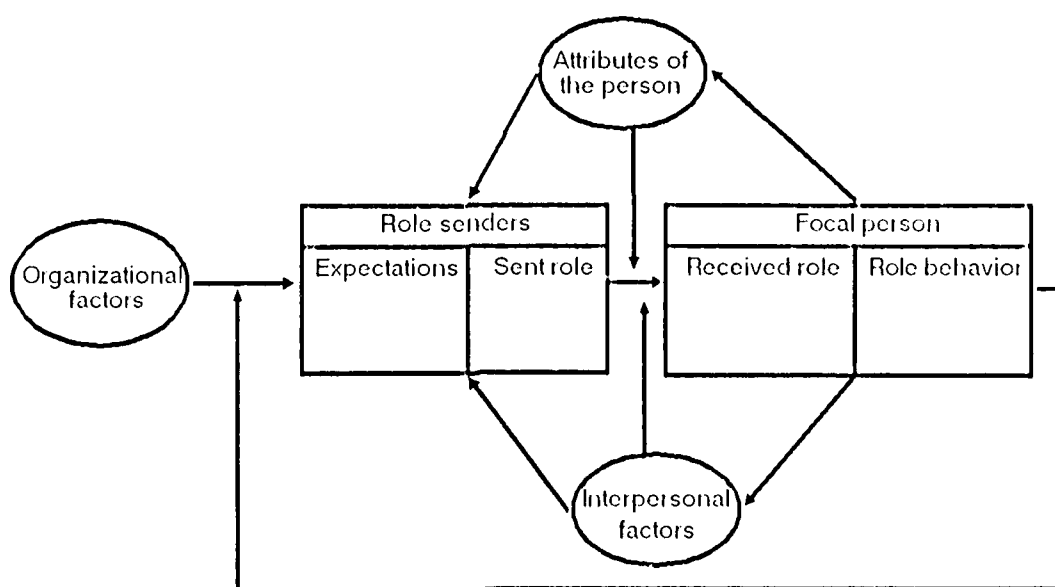


Figure 3. Theoretical role episode model (Katz and Kahn, 1966).

Hackman and Oldham. The job characteristics model developed by Hackman and Oldham (1980) predicts organizational motivation (see

Figure 4). Core job characteristics are the primary influences (some collectively and some independently) of the critical psychological states which determine outcomes. The job characteristics and psychological states are moderated by the individual's knowledge of the job and skill, by the need for personal growth and advancement and by satisfaction with the work environment (or context).

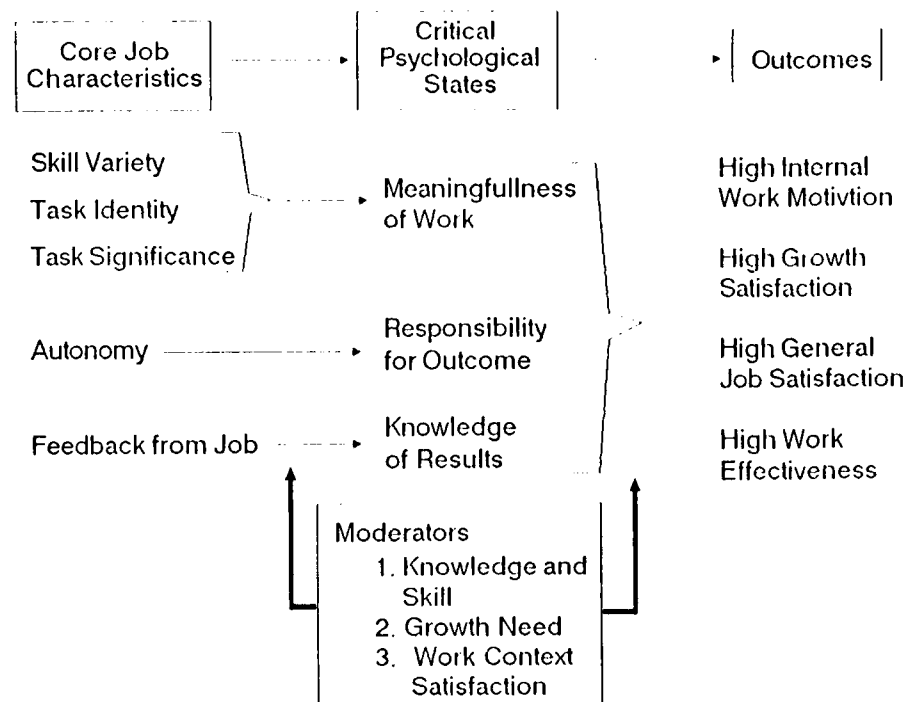


Figure 4. Job characteristics model (Hackman and Oldham, 1976).

Porter and Lawler. The Porter-Lawler model of occupational motivation (1963) says the effort an individual exerts is related to the value of rewards and the perceived probability of receiving the reward given that level of effort (see Figure 5). The individual's abilities and perceptions contribute along with effort towards

performance. The intrinsic rewards (those inherent in the work itself) and extrinsic rewards (those given in recognition) are moderated by the perceived ratio of effort spent versus reward received (equity of rewards). Feedback loops from the level of performance affects the perceived probability of receiving rewards and the equity of rewards. The value of rewards is moderated by feedback from the level of satisfaction the individual enjoys.

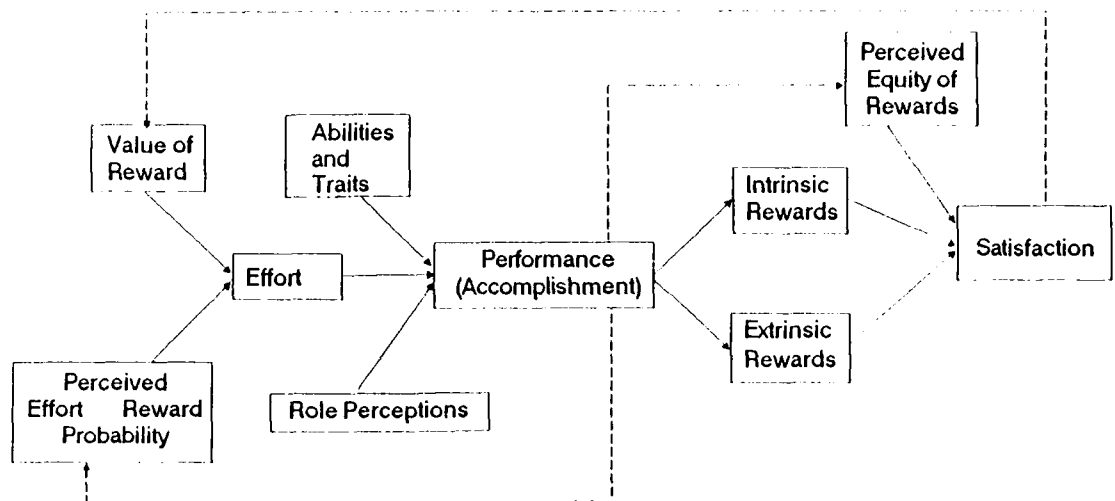


Figure 5. Occupational motivation model (Porter and Lawler, 1968).

Secrist. Secrist's total spectrum model of human and organizational effectiveness (1983) (see Figure 6) presents the process of translating basic human abilities into performance as a pipeline. The flow in the pipeline is dependent upon the job characteristics. The effectiveness of the translation process is influenced by the leader-supervisor who amplifies or attenuates the organizational climate variables. The climate is influenced by organizational context (or setting) and to a lesser degree by the

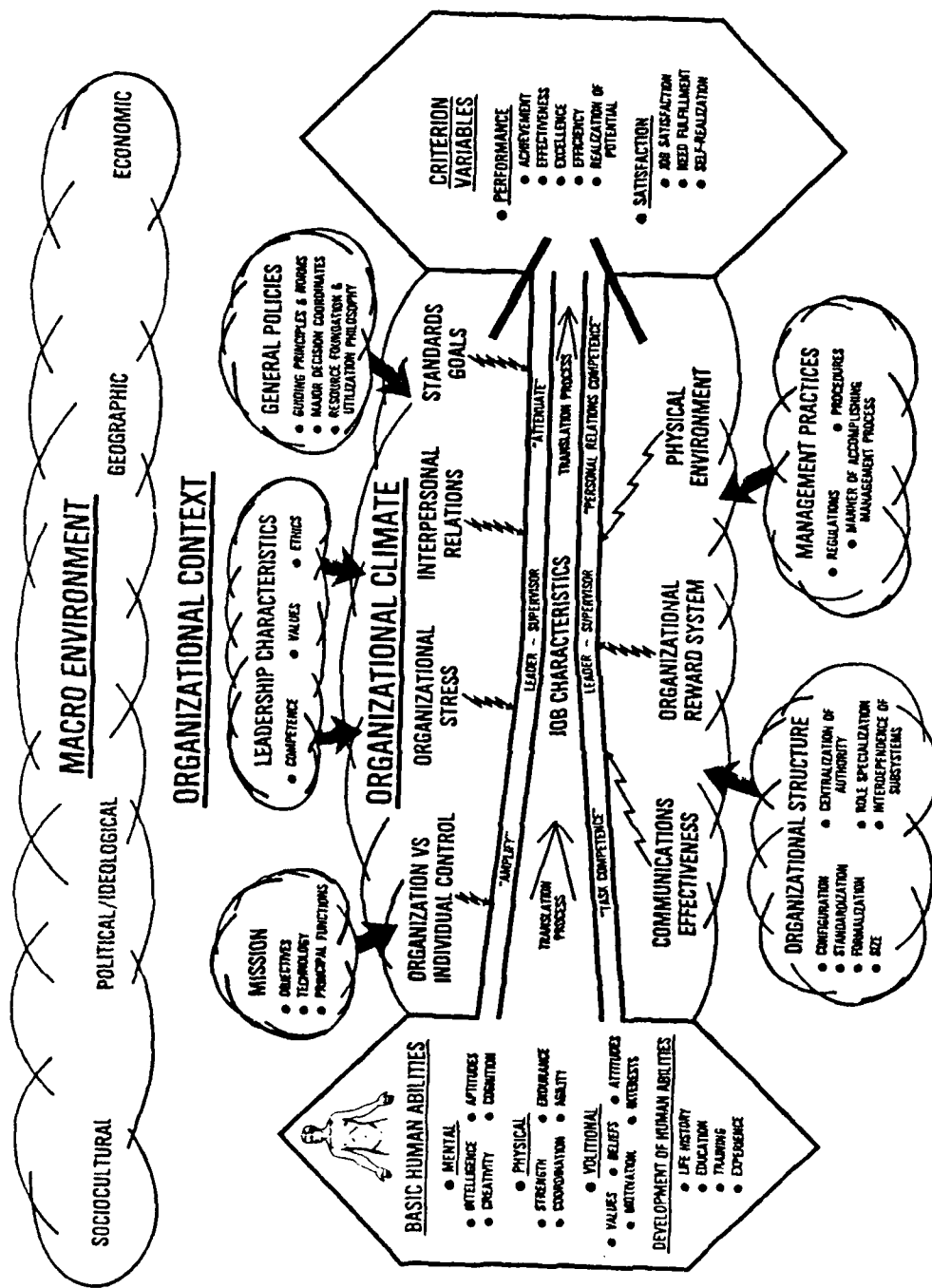


Figure 6. The Secrist total spectrum model of human and organizational effectiveness (Secrist, 1983).

macro environment. Secrist's model considers many complex issues in a well-structured form that can be used to capture individual or organizational attributes.

Naylor, Prichard and Ilgen. Studies by Naylor, Pritchard and Ilgen (1980) went beyond modeling and proposed a theory of behavior in organizations. A much simplified diagram of their theory is shown in Figure 7. Their theory is based on the attitudes, perceptions and efforts of the individual. The environment and individual differences lead to individual perceptions of the work. Individual perceptions lead to contingencies (the process for transforming actions into products and outcomes). The effect (or individual satisfaction) depends upon the outcome and the evaluation of individual satisfaction) depends upon the outcome and the evaluation

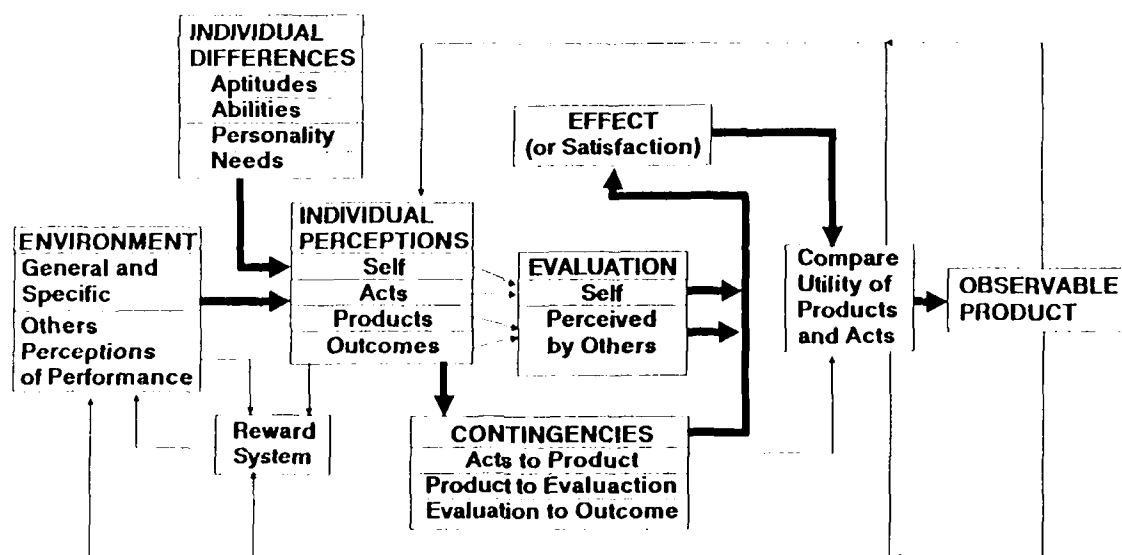


Figure 7. Theory of behavior in organizations (Naylor, Pritchard and Ilgen, 1980).

of the outcome. Then, a comparison of the usefulness (utility) of the products and acts feeds back information to the environment and perceptions.

Naylor, Pritchard and Ilgen proposed several functional relationships to explain their theory. The relationship between individual perceptions and evaluation are examples. The input to the Self block of Evaluation depends upon the relative importance of the Self and Acts blocks of Perception.

$$E_{\text{self}} = W_{\text{self}}P_{\text{self}} + W_{\text{acts}}P_{\text{acts}}$$

The variable W is a weight and the variable P is a perception. The inputs to the Evaluation Perceived by Others block are the Product block and Outcome block of Perceptions.

$$E_{\text{others}} = W_{\text{products}}P_{\text{products}} + W_{\text{outcomes}}P_{\text{outcomes}}$$

They also postulated creation of nonlinear relationships for many of the weighting factors such as these samples in Figure 8.

Figures 1 through 7 each contribute to the understanding of organizational behavior. Figures 3 through 7 identify the influences on the individual as the principal determinant of performance. The interactions suggest important relationships which should be maintained in automating human behavior.

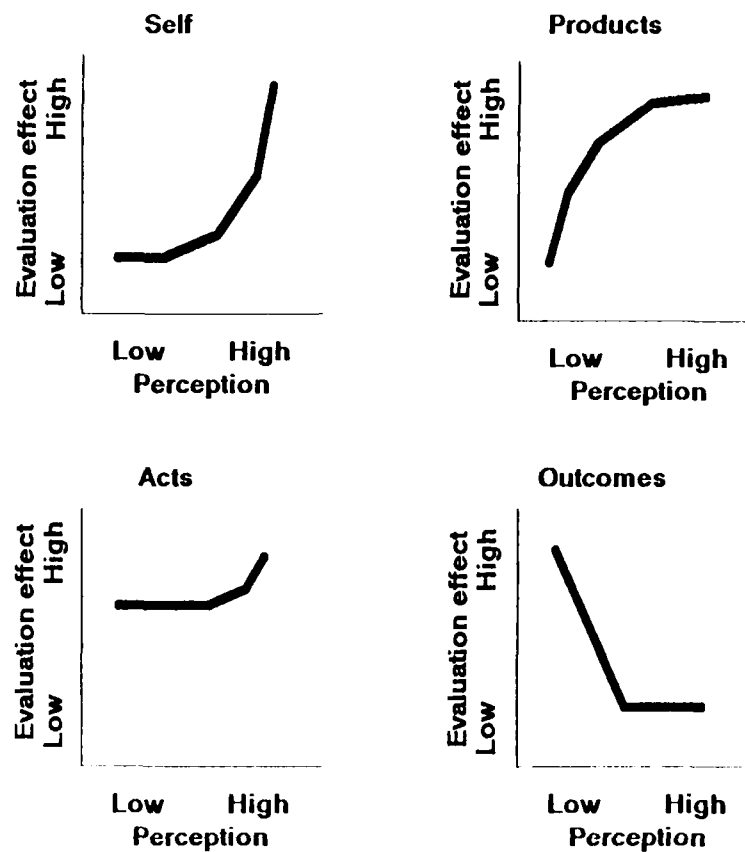


Figure 8. Weighting of perceptions (Naylor, Pritchard and Ilgen, 1980).

Expert Systems Development

The study of expert systems is one division in artificial intelligence research. Expert systems are computer programs which try to capture the knowledge of experts and use logical applications of that knowledge to recommend decisions, to make evaluations or to find new knowledge (Nilsson, 1980). Hopefully, the results of an expert system are consistent with those of a real expert. In this way, a computer program can help nonexperts arrive at expert

results. This possibility has prompted a lot of research and investment in expert systems development.

Expert system structure. The scope of expert systems varies greatly with the application. A simple system might use reference data in a "table lookup" fashion to guide the user to an expert solution (Roach, Virkar, Weaver and Drake, 1985). A complex and powerful expert system could find errors in new theories by considering permutations of previous experience (Hayes-Roth, 1983). Whether simple or complex, each expert system contains an inner structure similar to Figure 9 (Hayes-Roth, 1985).

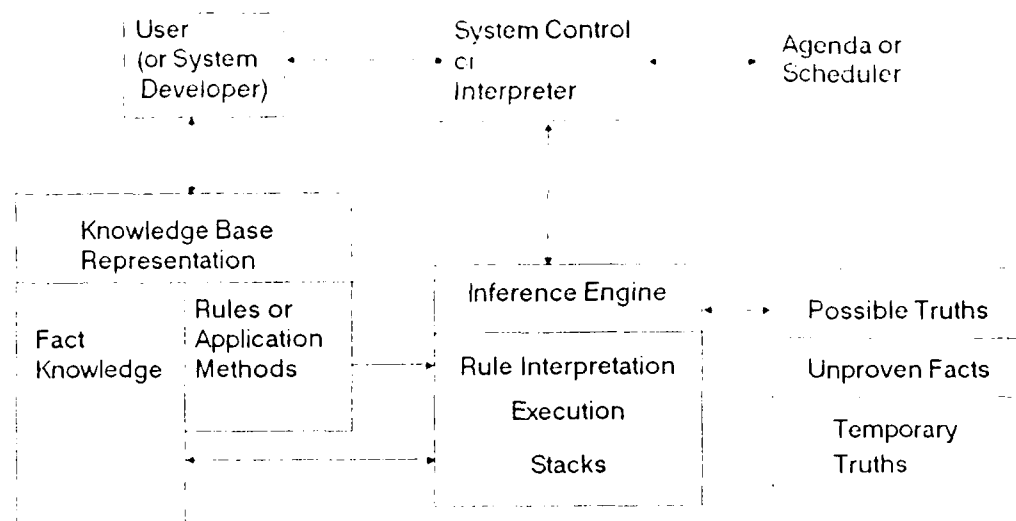


Figure 9. The structure of a typical expert system (Hayes-Roth, 1985).

In Figure 9, the user interacts with a knowledge base and the system controls. The knowledge base consists of known facts about the problem and some rules or applications methods which can

manipulate the facts to learn new facts. The system controller interprets the intentions of the user and controls the application of the inference engine. An agenda is maintained by the system controller to give order and to keep track of necessary tasks. The inference engine uses rule interpretation to execute actions. In the process of examining possible truths, the inference engine creates stacks of requirements which must be fulfilled before unproven facts or temporary truths can be resolved and either added to the knowledge base or discarded. The inference engine is the workhorse of the expert system. It performs the unification and resolution refutations procedures necessary to extract answers from individual facts (Nilsson, 1980).

Expert system knowledge representation. There are three main ways to represent known facts. The first method uses ordered sets or lists to store discrete information (Gensereth and Ginsberg, 1985). A brief example illustrates this representation. John, a journeyman, may be able to do his work well and may desire additional rewards. These facts could be represented as:

ABILITY.TO.DO.WORK (John, Well)

MEMBER (John, Journeyman)

NEEDS.REWARDS (John, High)

The variables ABILITY.TO.DO.WORK, MEMBER and NEEDS.REWARDS are attribute identifiers. The two elements in parentheses show who has this attribute (in this case John) and the value of the attribute

(Well, Journeyman and High). These lists are a simple form of predicate calculus (Nilsson, 1980). The inference engine can find the value of an attribute for any person by checking every identifier of the attribute, comparing names of persons and returning the found value. This method of knowledge representation is common to PROLOG and LISP (Winston and Horn, 1981).

Another way to represent knowledge is through rules (Hayes-Roth, 1985). Rules evaluate the knowledge base and create new truths or new knowledge. Creating new information with rules when it is needed reduces the amount of knowledge which needs to be stored. For example, all journeymen are skilled craftsmen. A corresponding rule would be:

```
IF MEMBER (X, Journeyman)
THEN ABILITY.TO.DO.WORK (X, Well)
```

This rule says, if something (X) is a journeyman, then create a new fact that something (same X) is able to do work Well. The rule eliminates the need to have ABILITY.TO.DO.WORK (Person, Well) for every person who can be shown to be a journeyman. The process of applying rules and finding out the possible outcomes is called forward chaining. The inference engine can also find out if a person is able to do work well by looking for facts or other rules which prove that the person is a journeyman. This process is called backward chaining (Nilsson, 1980).

The third way of storing information is as a unit (sometimes called an object or frame). This way, relative information is

grouped together as a record in slots of the unit. Continuing the example above, a unit called John could be shown as:

```

=====
  Unit name:  John
-----
  Slot name:  ABILITY.TO.DO.WORK
             Slot value:  Well
  Slot name:  NEEDS.REWARDS
             Slot value:  High
=====

```

The inference engine can find the value of an attribute for any person by checking all units, comparing names and returning the value (see Fikes and Kehler, 1985 for a good summary of unit systems).

The use of units allows more structure and control over the knowledge base. Structuring the knowledge base can allow units to inherit slots and slot values from other units such as in Figure 10.

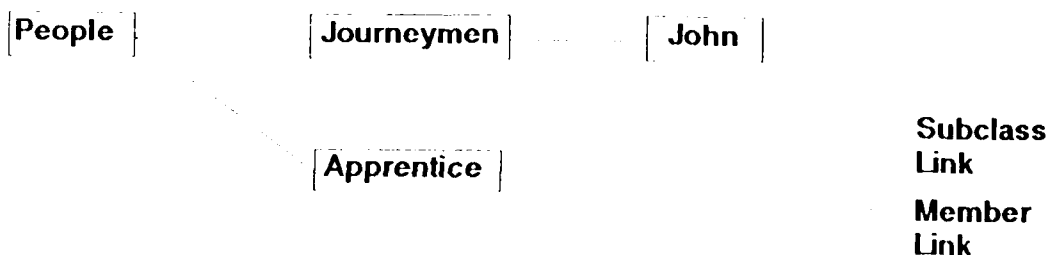


Figure 10. Unit based knowledge representation.

Assume the unit called People has empty slots called ABILITY.TO.DO.
WORK and NEEDS.REWARDS. The unit could be shown as

= = = = =

Unit name: People

Slot name: ABILITY.TO.DO.WORK

Slot value: unknown

Slot name: NEEDS.REWARDS

Slot value: unknown

= = = = =

Since all Journeymen are in the class of objects called People, they inherit the slots which unit People has. All journeymen are well skilled so the default value for ABILITY.TO.DO.WORK of Journeyman is Well. The Journeyman unit could be shown as

= = = = =

Unit name: Journeyman

Super class: People

Slot name: ABILITY.TO.DO.WORK

Slot value: Well

Slot name: NEEDS.REWARDS

Slot value: unknown

= = = = =

When an object is a member of a class of objects, much is known about the object without explicit explanation (Stefik and Bobrow, 1986). An object in the class of automobiles, for instance, normally has four wheels, some type of engine, a weight, a general size, a top speed and other limits on what can be done with the object. This method of structuring the knowledge base helps store some of the knowledge in the structure itself. In Figure 10, the membership of John in Journeyman is shown by the dotted line. With this structure, the unit John would appear:

=====

Unit name: John

Member of: Journeyman

Slot name: ABILITY.TO.DO.WORK

Slot value: Well

Slot name: NEEDS.REWARDS

Slot value: unknown

=====

John inherits all the slots that People has through membership in Journeyman. John's value of ABILITY.TO.DO.WORK is the inherited default, Well. The NEEDS.REWARDS slot is inherited unfilled (unknown) and can be filled using some other part of the system.

Expert system history. In early first generation expert systems such as DENDRAL which automates the determination of

molecular structure of chemicals from empirical formulas, developers used predominantly predicate calculus to represent knowledge. They had to create their own inference engine to work specifically with their system. Second generation expert systems such as MYCIN which performs infectious disease consultations, were developed around domain-independent modules to interpret rules and acquire new knowledge. The independent modules give limited flexibility in applying the inference engine to other problems. Third generation expert systems are being built on new, commercially available expert system tools such as KEETM,* Knowledge CraftTM and S.1TM which provide most of the architecture needed for control and implementation of knowledge based systems. These state-of-the-art tools allow the developer to use rule based, frame based and/or logic based methodologies in the expert system without concern for the inner working of the inference engine, execution methods and maintenance of possible facts. It is now possible to create prototype systems in weeks where before it took years (Friedland, 1985).

*KEE is a trademark of Intellicorp. Knowledge Craft is a trademark of Carnegie Group, Inc. S.1 is a trademark of Teknowledge.

RESEARCH DESIGN

The research design and development of the prototype expert system are the main contributions of this research. This chapter describes selection of a behavioral model, identification and transformation of behavior rules, choice of system variables and development of a survey questionnaire to measure the variables. Also, the knowledge base representation (both rules and facts) is explained with the system controlling functions. The method of validating the prototype is presented as well.

Behavioral Model Selection

Model requirements. A good behavioral model is needed to give application and direction to the expert system. The model must be complex enough to capture the requisite variety of human behavior and yet be simple in its structure and form (Mason and Mitsoff, 1981). Its components must be measurable for application and must be flexible to allow variations for different usage. For this prototype research, the model needs a scope sufficient to validate the concept of an automated management consultant and yet be small enough to be achievable. The models in Figures 1, 4, 5, 6 and 7 display appropriately complex relationships. Those in Figures 1, 2, 4 and 6 have somewhat simplified structures. The models in Figures

2, 4, 5 and 6 have more easily measurable components. And, models Figures 1, 3, 5, 6 and 7 give flexibility in their application.

Model selection. The Secrist total spectrum model of human and organizational effectiveness gives the best combination of factors. However, the scope of the model is too large. Figure 11 shows a model of reduced scope which appears reasonable for this research. The macro environment in Figure 6 is a fairly constant influence relating primarily geopolitical and cultural variations. The elements of organization context are related to the firm's technology, structure, policies, leadership and major objectives. These influences are generally stable and can be eliminated for this prototype work without jeopardizing validity.

Behavior Rules

Known findings. As part of his work in developing the total spectrum model, Secrist (1981) compiled a large number of research findings to substantiate his views. Findings identify interrelationships among the organizational environment, worker needs and desires, working conditions, individual attitude and other attributes describing the work force. Some findings relating to management style, organizational policy, individual volition and cultural or ideological influence were generally eliminated from consideration in the reduced model.

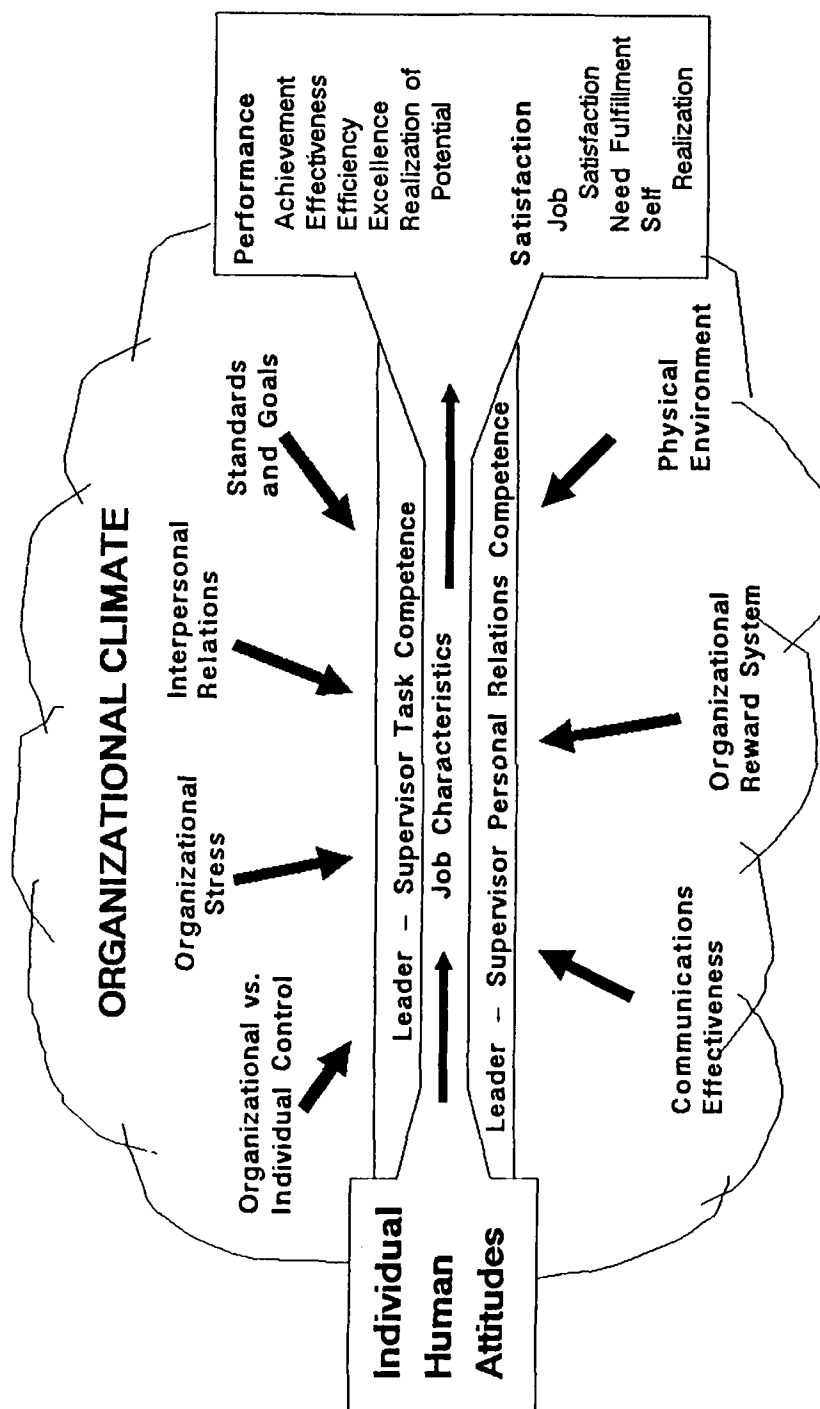


Figure 11. Reduced model of organizational climate and performance.

Researchers have published very consistent findings on many elements contained in the reduced model, particularly in the areas of stress, communications, individual versus organizational control and job characteristics. After study of over 300 research reports summarized in Secrist's work (1981) or other sources, fifty-one preliminary findings were selected which combine and represent the major, consistent and replicatable research relating organizational climate to performance. These few rules do not attempt to capture the total knowledge of the findings. They are a cross sectional sampling to show the concept of rule transformation from behavioral findings. A short phrase describing each named rule and its source is included in Appendix 1.

The behavior rules represent expert knowledge of organizational behavior, group dynamics and psychological behavior. They form the key relationships at the heart of the expert system. The behavior rules evaluate individual attitudes and climate variables and make corresponding contributions to the performance and satisfaction measures. Figure 12 illustrates this central translation role between attitudes and performance.

Sample rules. Several findings consider the contribution of autonomy to performance in organizations that need creativity with high correlation coefficients (r) and low probability of error (p). Patchen's (1970) large scale multivariate investigation of 800 nonsupervisory engineering and power plant employees found "that increased employee control over work methods resulted in greater job

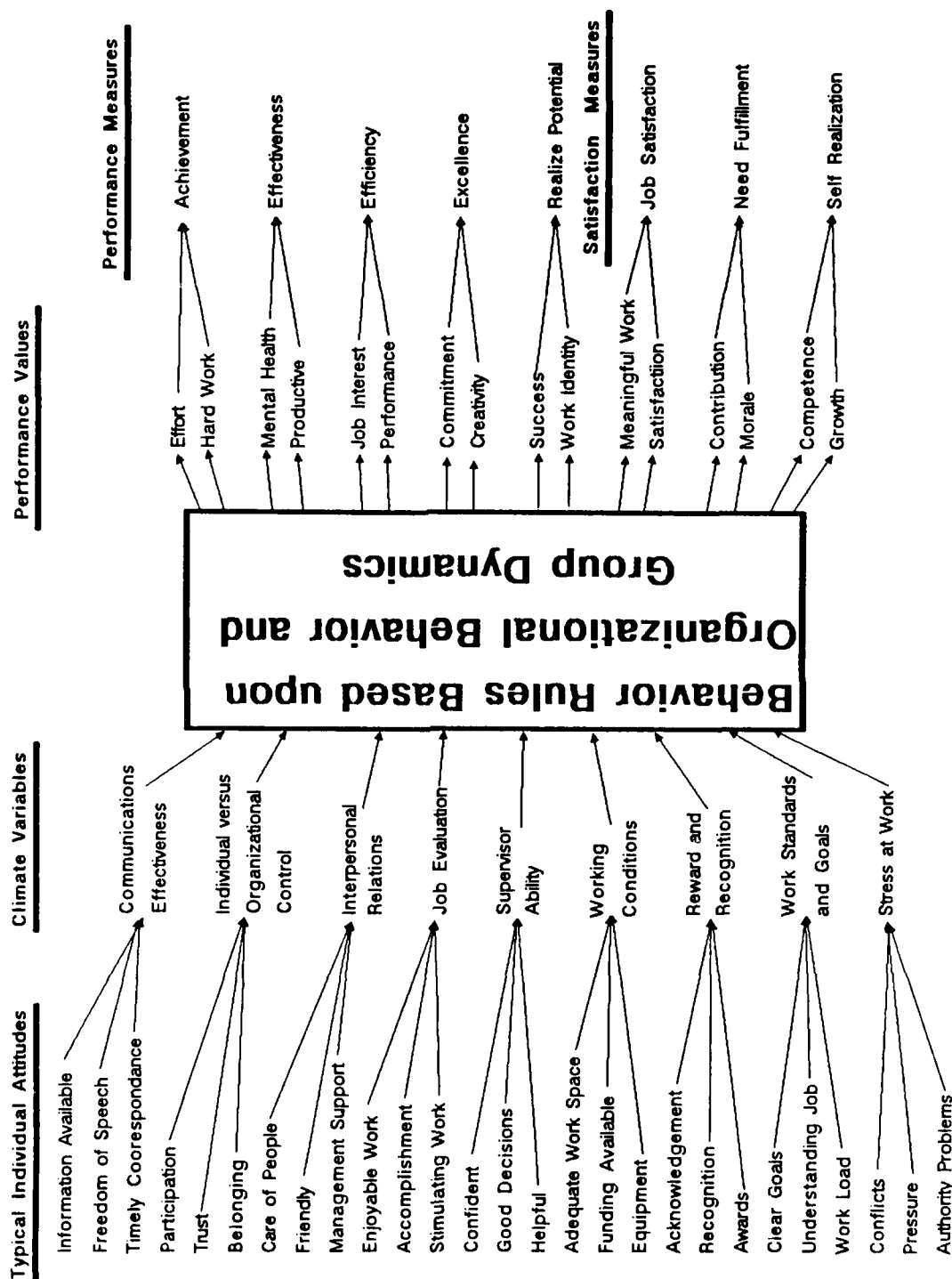


Figure 12. The central translation role of behavior rules

interest ($r = .42$, $p < .01$), higher interest in work innovation ($r = .31$, $p < .01$), more pride in job accomplishment ($r = .55$, $p < .01$), and fewer symptoms of stress ($r = .37$, $p < .01$)" (Secrist, 1931). Transforming Patchen's findings into a rule required establishing measures of employee control, job interest, work innovation, pride in accomplishment and stress. The variables selected to represent these measures are: IND.ORG.CONTROL, a climate variable representing individual versus organizational control; SKILL.VARIETY and INDEPENDENT.THUGHT, individual attitudes concerning the job evaluation and the need for creativity; ACHIEVEMENT, EFFICIENCY, EXCELLENCE, JOB.SATISFACTION, NEED.FULFILLMENT and REALIZATION.OF.POTENTIAL, performance measures. (The selection of variables and their use is discussed at length in the next section.) Paraphrasing Patcher's findings into two general statements which include the transformation variables gives two rules:

Autonomy Creativity

Where employees have control over work methods (IND.ORG.CONTROL) and while there is a need for creativity (SKILL.VARIETY, INDEPENDENT.THUGHT), there is increased innovation (EXCELLENCE, REALIZATION.OF.POTENTIAL).

Autonomy Pride

Self-control (IND.ORG.CONTROL) is related to greater job interest (ACHIEVEMENT, EFFICIENCY, JOB.SATISFACTION) and more pride (NEED.FULFILLMENT).

Transforming these paraphrased statements further into if-then rules using just the variables gives:

Autonomy Creativity

IF (IND.ORG.CONTROL is positive)
 and (The average of SKILL.VARIETY and
INDEPENDENT.THUGHT is positive)
 THEN (Add IND.ORG.CONTROL to the list of factors
 contributing to EXCELLENCE)
 and (Add IND.ORG.CONTROL to the list of factors
 contributing to REALIZATION.OF.POTENTIAL)

Autonomy Pride

IF (IND.ORG.CONTROL is positive)
 THEN (Add IND.ORG.CONTROL to the list of factors
 contributing to ACHIEVEMENT)
 and (Add IND.ORG.CONTROL to the list of factors
 contributing to EFFICIENCY)
 and (Add IND.ORG.CONTROL to the list of factors
 contributing to JOB.SATISFACTION)
 and (Add IND.ORG.CONTROL to the list of factors
 contributing to NEED.FULFILLMENT)

In these two rules, positive means a positive contribution to some desirable result. If IND.ORG.CONTROL was not positive (neutral or negative) then no contribution is made by IND.ORG.CONTROL in either of the rules.

At this point it is appropriate to discuss how rules are used in expert systems. Rules are generally used to find truth. To illustrate this consider three rules.

If A then B Rule 1

If B then C Rule 2

If A then C Rule 3

The application of Rules 1 and 2 gives the same result as Rule 3. (This is called resolution in predicate calculus.) Suppose in an expert system, Rule 1 and Rule 2 were applied by the inference engine. If Rule 3 then became a candidate for application, the inference engine would throw out Rule 3 because it is redundant. The relationship between A and C had already been shown.

The inference engine's ability to eliminate redundancy greatly speeds up the computation process and eliminates wasted efforts. However, this ability is not always desirable. The behavior rules, for example, measure contributions to performance. If the behavior rules are used in the standard way, the contributions would be distorted. If two rules contributed the same amount, the inference engine would assume one was redundant and throw it out. Because of this, the behavior rules were transformed into applications methods. The use of methods allows specific control over the application of the rule. Methods will be discussed further in following sections.

More examples. Two more rules dealing with the contribution of cohesiveness are good examples of how rules can chain together.

Both Likert (1961) and McGregor (1960) found that groups which have a highly participative environment (EFFECTIVE.PARTICIPATION, an intermediate variable); clear, understandable goals (STANDARD.GOALS, a climate variable); frank, open communications (COMM.EFFECTIVENESS, a climate variable); have an integrated reward system (REWARD.SYSTEM, a climate variable); share mutual influence (LACK.OF.INFLUENCE, a negative individual attitude) and are willing to deal with conflict (STRESS) are highly cohesive (COHESIVE, an intermediate variable). This is called the Cohesive Goals rule. It creates a measure of cohesiveness from individual, intermediate and climate variables.

In a separate finding, Seashore (1951) found that highly cohesive groups (COHESIVE) are above average in performance (ACHIEVEMENT, EFFECTIVENESS, EFFICIENCY and REALIZATION.OF.POTENTIAL, performance measures) when they accept organizational goals (STANDARDS.GOALS, a climate variable). This rule is called the Cohesive Accept rule. Applying these two rules together through the intermediate variable COHESIVE contributes positively to performance measures in proportion to the levels of participation, acceptance of goals, communication effectiveness, and lack of stress.

Some of the findings are better transformed by splitting them into multiple rules (like Autonomy Creativity and Autonomy Pride discussed previously). Other findings tend to overlap. Redundant

findings were eliminated but overlapping findings which contributed depth to the rule base by bringing additional variables into play were included.

Questionnaire

Variables. The preceding discussion of behavior rules introduced, by necessity, variables to measure attributes. For the rules to evaluate a situation, some measure of the situation is needed.

The process of transforming the behavioral findings into rules for the expert system identified nearly a thousand separate variables. By carefully combining synonyms, grouping attributes, using negation and stretching meanings a little, the number of variables was reduced to about 150. As much as possible, known measurable psychometric measures were used for the variables (see next section). The variables fell into three groups: basic measures of individual attitude, intermediate variables created by combined attitudes or as a result of chaining rules, and performance measures. The basic attitude measures are categorized by the climate they help describe and are shown in Appendices 2 through 11. The intermediate variables and their derivations are in Appendix 12. Appendix 13 lists the performance measures and the words describing performance that are attributed to each measure. (Note: some words contribute to more than one measure like the word performance in the Cohesive Goals rule discussed earlier.)

The variables used to measure basic human attitudes were given short names for use in the computer. The short name does not always give the full meaning of the attitude being measured. The appearance of the short names sometimes causes a transformed rule to appear different than the original finding. A review of the metric used to measure the attitude clarifies the variable name. (Questionnaire metrics are discussed in the next section.) The rules are very representative of the findings. This is a critical factor since the strength of a rule is in the correct transformation of the behavioral research behind the rule and in the accuracy of the metric assigning values to the variables.

Measuring individual attitudes. Many different sources were used to find valid, consistent psychometric measures of the needed attitude variables. Secrist, McNee and Paden (1981) performed extensive internal consistency analysis and factor analysis in developing measures to describe leader-supervisor competence, organizational versus individual control, organizational stress, interpersonal relations and the reward system climate variables. The Hackman-Oldham job diagnostic survey was used to measure job characteristics. Findings by other researchers were used to form new measures for communications effectiveness, standards and goals and physical environment climate variables.

A survey questionnaire was developed combining the different metrics to measure individual attitudes. The questionnaire makes a statement (taken, as much as possible, directly from the source of

the variable) referring to some attitude or attribute of the work place. The respondents indicated agreement or disagreement along a Likert scale. A complete listing of the questionnaire statements, their variable names and sources categorized by climate variable is included in Appendices 2 through 11. The response alternatives were phrased to be at least one standard deviation apart (Dyer, Matthews, Wright, and Yudowitch, 1995). The values of the responses are scaled to fall within the range minus one to plus one. With this scaling, zero is neutral and positive values reflect a positive contribution to some desirable state (except for stress variables which are consistently used as negative measures).

The variables were grouped according to the framework of the selected model in Figure 11. Each group of variables is combined together to form the climate measure for that group (e.g., in Appendix 2, COMM.EFFECTIVENESS is equal to the average of ACCURATE.COMM, ANSWERS.AVAIL, ..., SATISFIED.COMM). Speaking of his measures, Secrist explains, responses to individual statements are only valid for measuring the attitude or attribute implied by the statement. They are not, alone, good predictions of the climate measures. However, taken as a group, the average response is an internally consistent, highly reliable predictive metric of organizational climate (Secrist, McNee and Paden, 1981; G.E. Secrist, personal communication, May 21, 1987).

Computer Model

KEE (Knowledge Engineering Environment) was selected as the expert system development shell for this prototype system. KEE has an exceptionally easy user interface for creating precisely structured knowledge representations. It is a frame based platform for object oriented programming as well as the use of production rules. Its flexible inference engine can handle forward and backward chaining with various selection parameters. Many built-in procedures are available to invoke active values or image displays. LISP procedures are easily attached as method slots to any frame to handle special problems. The shell was implemented on a Texas Instruments ExplorerTM.*

Knowledge representation. Knowledge about individuals and organizations was grouped into classes. Each climate class contains slots for each attribute in the class. Interconnecting classes with class links enables subclasses to inherit slots from prior classes. Figure 13 displays the units which make up the subclass of Individuals. The class of Stress is expanded to show the slot names which correspond to attitude variables. John is a member of the Individuals class and inherits all the slots of Individuals with their default values. Appendix 15 lists the computer code of those classes which contribute to the Individuals class. The numeric value entered in a slot represents the person's attitude about that

*Explorer is a registered trademark of Texas Instruments.

Climate Categories

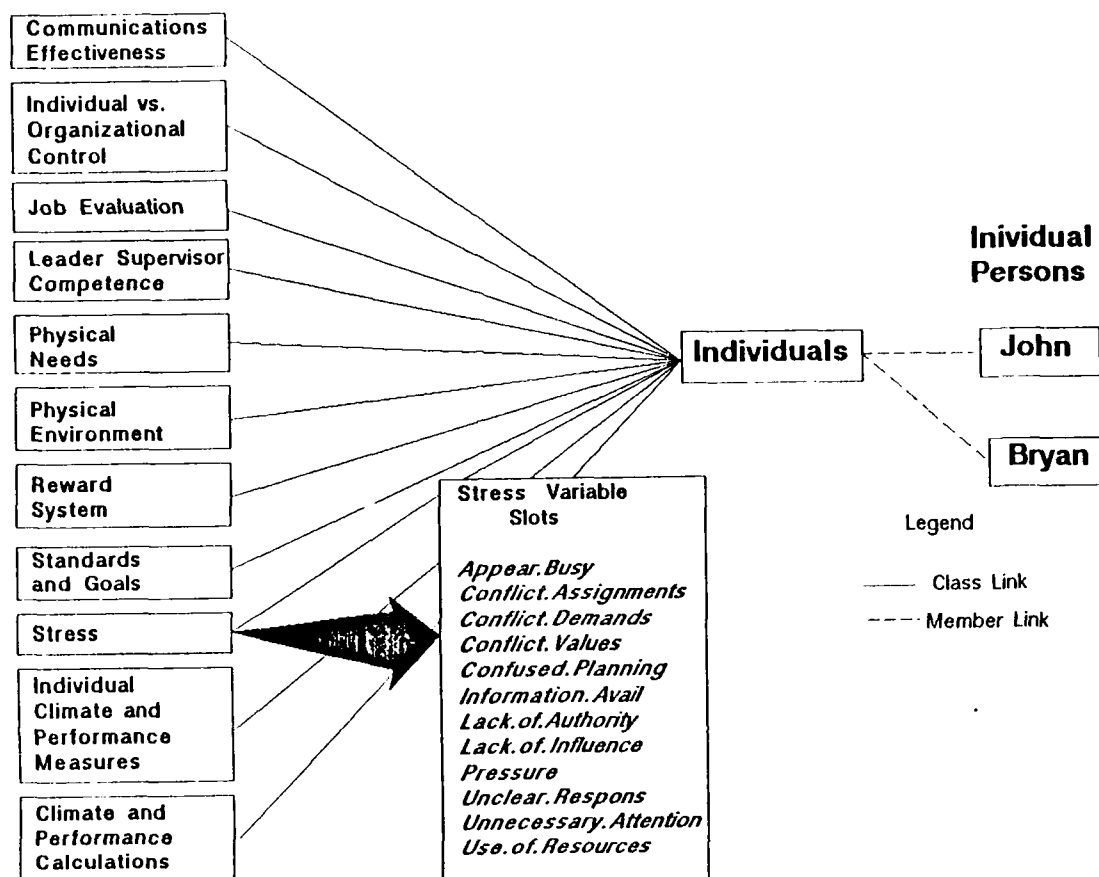


Figure 13. Representation of individuals.

variable. For instance, a person may respond to the statement, "In my job, I have to always look busy," (see Appendix 11) with "Slightly Agree." The response "Slightly Agree" is scaled to +.25 and stored in the slot called APPEAR.BUSY. The value of the variable APPEAR.BUSY is knowledge about an individual attitude. The value of this variable contributes along with other stress metrics to the climate measure STRESS. High levels of STRESS are sometimes

detrimental. STRESS is used by many rules in evaluating performance. A change in the value of APPEAR.BUSY would change the value of STRESS and therefore change the contributions STRESS makes towards performance.

Figure 14 is a similar display of the units which make up the class of Organizations. The inherited slots for Organizations include only those which are pertinent for organizations. This includes the class of Organizational Elements which is expanded in Figure 14 to show its slot names. The computer code representing Organizations and its superclasses is included in Appendix 15. As with persons, organizations are members of the class of Organizations and inherit all Organizations slots.

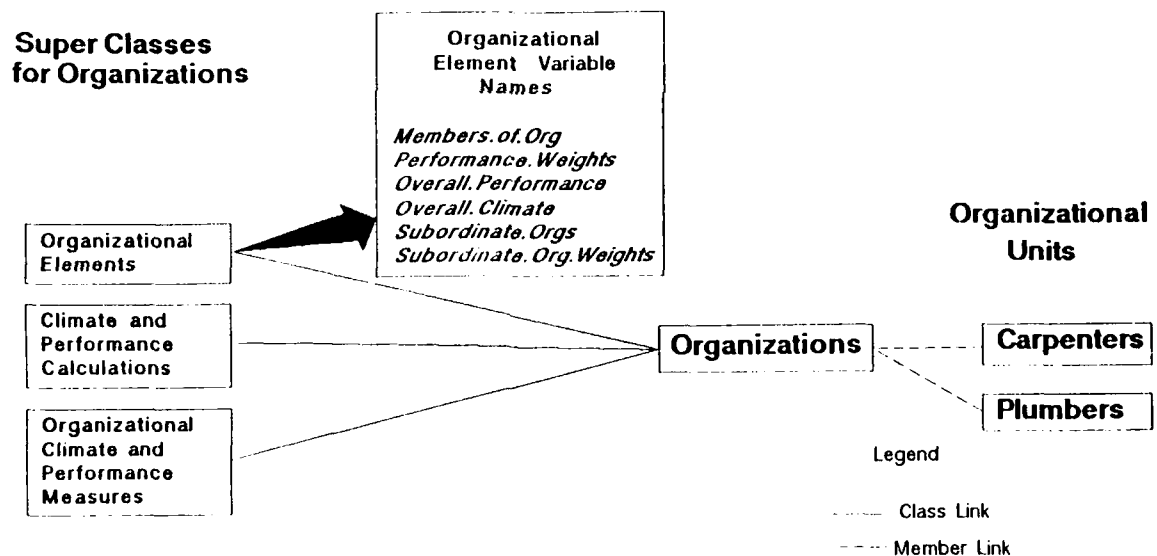


Figure 14. Representation of organizations.

Application methods. The behavior rules represent the findings of research experts transformed into a form the expert system can

understand. In this prototype management consultant, the rules are formulated as applications methods.

A method is a self-contained procedure which causes things to happen when the method is activated. As an example, there is a method slot in the Ind.Climate.Var.Calc unit called COMM.EFFECTIVENESS.CALC. This method is inherited by every person who is a member of the class of Individuals. To activate the method, a message is sent by the system controller to the person and the method COMM.EFFECTIVENESS.CALC is activated. COMM.EFFECTIVENESS.CALC averages the values of all attitudes grouped under the communication effectiveness climate measure and puts the average in the person's COMM.EFFECTIVENESS slot as new knowledge. A computer code listing of all the methods used in the expert system is included as Appendix 19.

The behavior rules methods function similar to this example. When it is time to apply a behavior rule, a message is sent by the controller to each rule requesting it be applied to a specific person. The rule is activated by the message. If the preconditions of the rule are satisfied for that person, then the rule contributes to the performance of that person.

Suppose the rule Role Clarity was sent a message for John. This rule says a lack of clarity (ROLE.CONFLICT) is substantially related to job tensions, turnover and proclivity to leave the job (JOB.SATISFACTION). The method examines John's slot called ROLE.CONFLICT. If the value there is negative (meaning there is a lack of clarity), that negative value is contributed to the

performance measure JOB.SATISFACTION. The contribution is handled by adding the contributed value to the list of all values which contribute to that performance measure. If John's ROLE.CONFLICT value was negative it would contribute negatively to John's JOB.SATISFACTION. After all the rules have been applied, another method averages all the contributed values into an overall performance measure. Positive contributions to John's JOB.SATISFACTION would be pulled down by any negative contribution. The amount of the decline depends on the magnitude of the negative value and the number and magnitudes of other contributions.

Control system. A control system is available to the user to enter new data, evaluate the expert system or display individual or organizational data. These functions are controlled by sending messages to methods as discussed previously. Figure 15 shows the

Control Functions

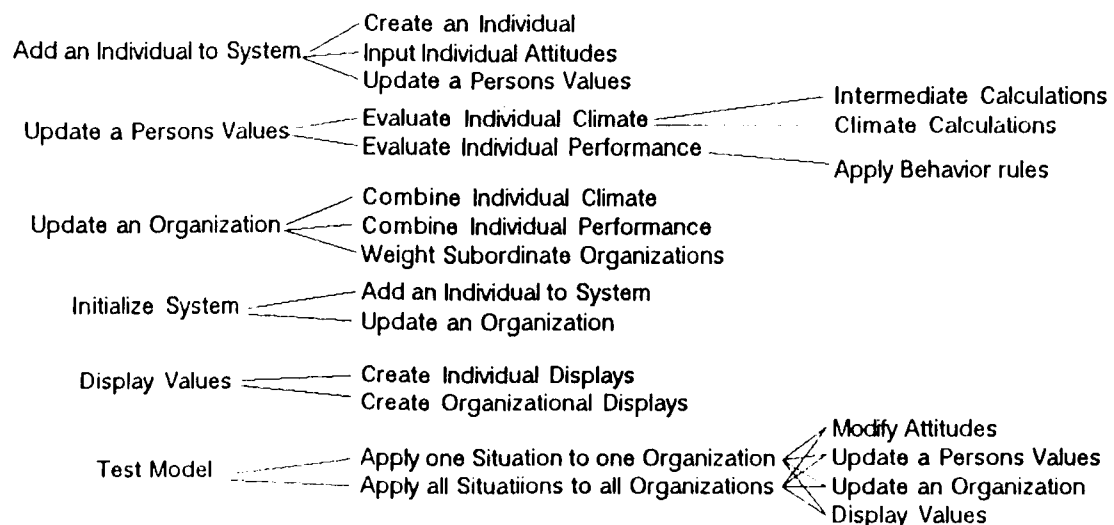


Figure 15. User control mechanisms.

main control mechanisms which may be called at any level. Some of the functions are nested so they send messages to each other.

System operation. The management consultant expert system contains the structured framework representing the class of Individuals and the class of Organizations. The Behavioral Rules unit has all methods available. To use the system, individuals and their organizations are entered into the model. Attitude values are stored in the person's own slots.

After individuals are entered into the model, individual intermediate and climate variables are calculated under direction of the controller. The behavior rules are applied, and their contribution to each performance measure is recorded. A set of methods averages all contributions into overall measures. The overall measures predict the levels of performance and satisfaction for each individual.

Organizational slot values are aggregated from the values of individuals in the organization. Overall organizational performance is calculated from weighted averages of the performance measures. (These weights were determined by interviews with the managers.) When individual and organizational computations are complete, the system is considered updated.

Use of model. The updated expert system represents the state of the organization at the time data were entered. The consultant predicts a relative level of performance. The absolute value of performance may not be comparable between organizations, but the

predicted value of performance can be used to show how changes in individual attitude can affect performance in that organization.

Organizational performance may be sensitive to changes in some attitudes and insensitive to changes in others. The sensitivity depends on the given organizational climate at the time. Use of the consultant allows managers to test situations (changes in attitude) and then make informed decisions based on the outcomes.

Validation of the Model

Organization selection. To validate the model, organizations were selected which represent a broad application base. The United States Air Force approved the use of the 67th Civil Engineering Squadron at Bergstrom AFB, Texas and 11 suborganizations within the squadron to provide test data. This squadron is very representative of a typical Air Force civil engineering squadron in both size and mission with the exception that the squadron's performance is rated well above average. Figure 16 shows a simplified organizational structure of a civil engineering squadron. The six organizations under the Engineering/Environmental Planning Branch include professional engineers, white collar technicians and administrative personnel. The six organizations as part of the Structural Maintenance Section contain skilled and unskilled craftsmen. Members of the organizations voluntarily completed the attitude questionnaire and their responses were loaded into the model.

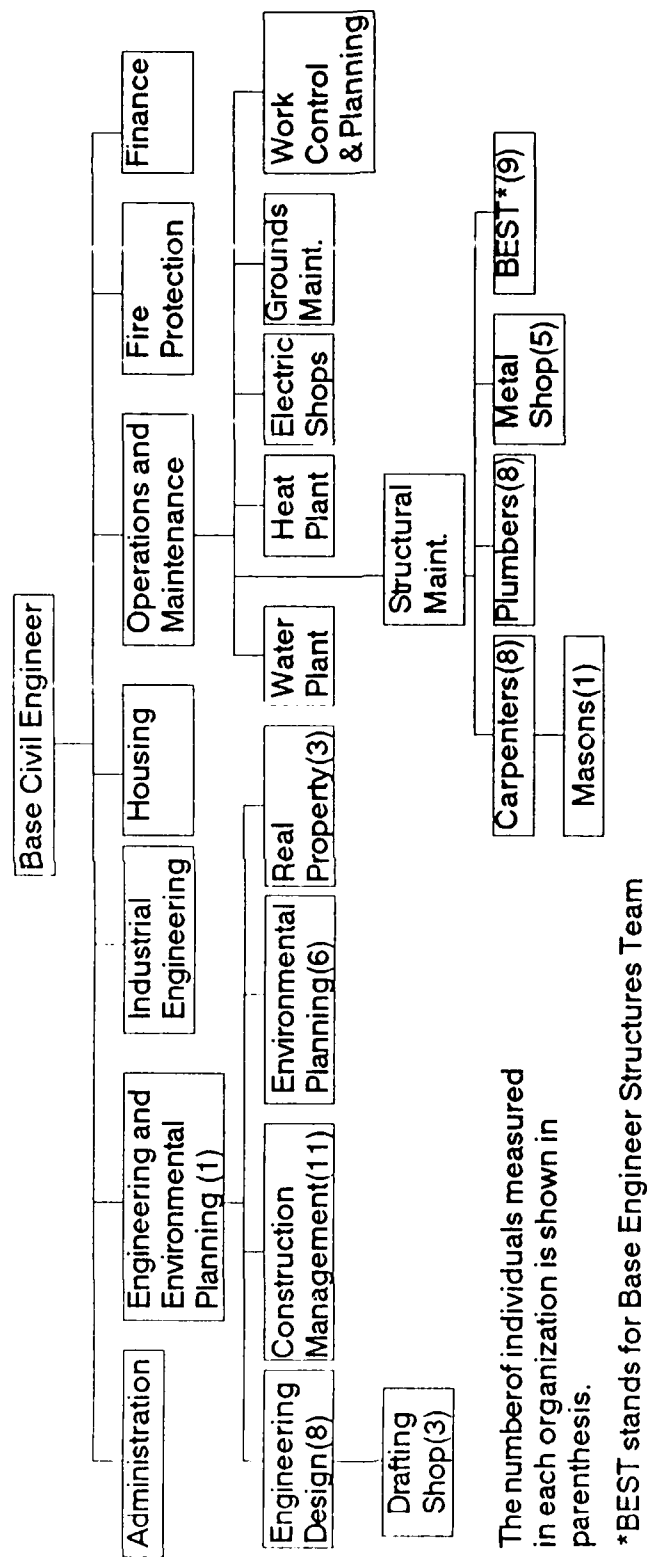


Figure 15. Organization of a typical Air Force Base Civil Engineering Squadron.

Eighteen hypothetical situations which could occur in almost any organization were selected (see Appendix 17). Each situation would generally improve or degrade one of the organizational climate measures. These situations became the test basis for validating the model.

Expert system predictions. For the expert system predictions, a review of the individual attitude variables was made for each situation. Attitudes which would probably change under the validation situations were identified as: improve a lot, improve a little, decrease a little or decrease a lot (see Appendix 17).

The computer predicts changes in performance by changing attitudes of individuals according to the selected category for each situation. Attitudes which were to increase a lot were raised a lot according to a nonlinear, fuzzy logic algorithm (Goldkind, 1983; Zadek, 1984). Others were raised a little, decreased a little or decreased a lot according to other fuzzy algorithms. The computer code for the algorithms is in Appendix 18.

The fuzzy algorithms use a quadratic type transform. If an attitude was already high, raising it had little effect. If an attitude was low, raising it made a big difference. This carries over to the organization itself. If the organization has a very effective communication system, suggested improvements would have little effect. If the communication system was poor, improvements may make a great deal of difference.

The changes in performance for each organization and each situation were recorded. These changes are the program's best predictions of how the situations would affect the real organization.

Managers' predictions. Managers of each organization were also asked to predict the changes in performance and satisfaction measures for each situation. The possible responses were: great improvement, slight improvement, no change, slight decrease and great decrease for each measure (as shown in Appendix 17).

A comparison of the computer predictions and managers' predictions shows the agreement of the management consultant with the organizational managers' predictions.

DATA COLLECTION AND ANALYSIS

This section discusses the use of the survey questionnaire and the statistical comparison of the expert system's predictions to the manager's predictions.

Data Collection

Questionnaire use. Survey data were collected in two increments. The first group included craftsmen of the Structural Maintenance Section. Engineers and technicians of the Engineering/Environmental Planning Branch were in the second group. Each group was briefed on the purpose of the questionnaire and the nature of the associated research. Workers and managers voluntarily completed the confidential attitude questionnaire. The anonymous responses were identified only by organization and coded in the expert system.

The manager (or supervisor) of each of the 11 organizations was briefed about the role of job attitudes in job performance. The eight performance and satisfaction measures to be used by the expert system (see Appendix 13) were explained to the managers, and they were asked to weight the importance of each in their organization. Managers also considered each hypothetical situation in Appendix 17 and predicted how performance measures would change for their organization. Management predictions became the basis for validating the expert system.

Expert system predictions. Individual attitudes taken from the questionnaires were combined to calculate climate variables for the individual. Behavior rules were applied to the climate variables, individual attitudes and other intermediate variables to calculate individual performance measures. Organizational climate variables and performance measures were aggregated from the membership to establish reference performance levels.

The consultant considered each of the hypothetical situations for each computerized organization. Attitudes of individuals in the organizations were adjusted by the fuzzy algorithms according to categories shown in Appendix 17, and behavior rules were reapplied using the changed attitudes and climates. The consultant calculated the change of the new performance measures from the reference measures for each organization. Calculations became the program's predictions for validating the expert system.

Observations on data collection. Although not a direct part of this research, it is interesting to note that respondents to the survey were happy to express their attitudes. Many made verbal and written remarks saying many measurements were particularly relevant to their job. Simple observations of individual attitudes displayed many specific problems which could probably be easily rectified if known by the supervisor (e.g., isolated high stress levels, disgruntled employees and individual frustrations). Where effects were widespread, they show in the climate variables. The poor physical environment of the Drafting Shop is an example of this.

Because of confidentiality, organizations were not given feedback from the questionnaire. However, it is evident that the survey did identify specific needs within the organization which may be remedied. It also identifies both highly ambitious and motivated employees.

Statistical Analysis

Nature of the data. Managers reported their predictive measurements for each situation on a discrete Likert scale with a range from 1 to 5 with 3 being neutral. These responses follow an ordinal scale.

Consultant predictions were based on calculated changes in performance. Typical values of performance in the expert system ranged from 0.2 to 0.5. Most changes in performance measured between -0.1 and 0.1 on a continuous interval scale.

Scale differences in the two predictions limit the statistics that can be used to make comparisons. Most parametric statistical methods require at least interval scale (Pfaffenberger and Patterson, 1977). This leaves simple comparison tests, nonparametric tests or data manipulation to improve the data for parametric tests. All three methods are used in this analysis.

Concurrence test. In this test, managers' predictions were paired with the program's predictions and a simple agree/disagree decision was made (Sobel and van Breda, 1987). If managers predicted a performance measure would improve (or remain the same)

and the consultant predicted a positive difference in the measure the value of CONCUR was given the value of one. One was also given if both predicted negative/reductions in performance. If the two predictions disagreed, CONCUR was given a value of zero. In this way, the mean value of CONCUR for each situation and measure, for the 11 organizations, gives a probability of concurrence. The results of this test are in Table 1.

The probabilities of concurrence by performance measure are all above 0.70. The probabilities by situation ranged from 0.39 to 0.97 with two-thirds above 0.75. In situations where concurrence is less than 0.5, there is a significant difference between the managers and the consultant. Further work with managers is necessary to confirm their opinions in these situations before discounting the consultant.

The probability of concurrence listed by organization is in Table 2. The concurrence of the Engineering/Environmental organizations are quite consistent except for the Engineering Branch. This is unusual since the branch performance measures are aggregates of the organizations in the branch. This shows that the perceptions of the branch chief are significantly different from his subordinate managers. Again further work with the branch chief may clarify the differences.

TABLE 1

Probability of Concurrence

Situations (See Appendix 17)

Performance Measures (See Appendix 13)																			
Mean Value of <i>CONCUR</i> X 100																			
	1. Improved Comm.	2. Directed Work	3. Flexible Sched.	4. Major Disagree.	5. Free Time	6. Good Supervisor	7. Dull, Hard Work	8. Forced Relocat.	9. Poor Supervisor	10. Stopped Comm.	11. New Equipment	12. Poor Rewards	13. Detailed Plan.	14. Unclear Policy	15. Cash Rewards	16. Important Work	17. No Standards	18. Clear Goals	By Measure
<i>Achievement</i>	91	82	36	73	27	91	73	73	82	82	100	55	100	82	100	100	45	100	77
<i>Effectiveness</i>	100	55	73	91	18	100	64	64	82	100	64	45	73	82	100	100	64	91	76
<i>Efficiency</i>	91	27	55	64	9	100	73	82	91	91	91	64	91	73	100	100	64	73	74
<i>Excellence</i>	73	55	64	73	82	73	55	73	55	100	82	73	45	100	82	91	64	73	71
<i>Realization of Potential</i>	82	82	55	73	0	100	82	64	73	100	82	73	73	64	91	91	45	100	74
<i>Job Satisfaction</i>	100	64	64	91	82	100	82	64	82	91	100	73	100	82	100	100	45	100	85
<i>Need Fulfillment</i>	100	64	55	82	73	100	91	82	73	82	100	73	100	82	100	100	45	100	83
<i>Self Realization</i>	100	64	55	73	18	100	82	55	64	91	100	82	100	55	91	100	45	100	76
By Situation	92	61	57	77	39	95	75	69	75	92	90	67	89	74	95	98	52	92	77
Overall																			

Performance Measures (See Appendix 13)

TABLE 2
Probability of Concurrence by Organization

<u>Organization</u>	<u>Mean Value of CONCUR</u>
Drafting	0.88
Engineering Design	0.85
Environmental Planning	0.74
Real Property	0.71
Construction Management	0.65
Engineering Branch	0.49
Masons	0.38
Carpenters	0.76
BEST	0.39
Plumbers	0.83
Metal Shop	0.81

The concurrence test indicates the consultant agreed with managers' predictions 77% of the time. This is very good considering that the managers concurred with each other 31% of the time when they evaluated the situations.

Nonparametric rank test. Many nonparametric tests deal with rank values of data rather than the data itself. Spearman's rho coefficient uses the Pearson moment correlation formula for normal paired correlation substituting paired rank values for the paired data values (Pfaffenberger and Patterson, 1977). The Spearman rho coefficient for comparing predictions for all organizations was 0.55

with a probable error less than 0.0001. The coefficients listed by organization are in Table 3. The Spearman rho test is valid over the full range of situations but is not valid for individual situations where few data points are clustered.

TABLE 3

Spearman rho Coefficient by Organization

<u>Organization</u>	<u>rho</u>
Drafting	0.70
Engineering Design	0.57
Environmental Planning	0.50
Real Property	0.41
Construction Management	0.57
Engineering Branch	0.35
Masons	0.70
Carpenters	0.55
BEST	0.63
Plumbers	0.31
Metal Shop	0.39
Overall	0.55

One improvement in the Spearman rho test was obtained by averaging the predicted performance measures within each situation by organization. Using the mean of the eight performance and satisfaction variables appears appropriate since the measures were

very consistent within situations. With the reduced number of data points, the Spearman rho coefficient was 0.66.

This test is stronger than the simple concurrence test. It shows a solid correlation between consultant predictions and management predictions of performance and performance averages.

Approximate parametric tests. When the eight discrete performance predictions from organization managers were averaged by situation, it made the predictions pseudocontinuous and almost interval. Although it may not be completely valid, the paired averages were compared using the Pearson moment correlation. The correlation coefficient for the engineering group was 0.57 and for the structures group was 0.51 at probable error of 0.0001. The overall coefficient was 0.63. The coefficients by organization are in Table 4.

The correlation test is more restrictive than the nonparametric tests. It relates closeness of fit between the prediction pairs. Values above 0.5 represent close correlation for behavioral issues. This is confirmed by concurrence tests using the averaged predictions giving 0.94 for the structures group and 0.83 for the engineering group.

Questionnaire evaluation. A stepwise regression analysis of the questions used to measure climate variables was performed to

TABLE 4

Pearson Moment Correlation Coefficient by Organization

<u>Organization</u>	<u>Coefficient</u>
Drafting	0.61
Engineering Design	0.55
Environmental Planning	0.55
Real Property	0.33
Construction Management	0.71
Engineering Branch	0.23
Masons	0.85
Carpenters	0.59
BEST	0.67
Plumbers	0.88
Metal Shop	0.38
Overall	0.63

evaluate the questionnaire. The results are in Tables 5 through 14. In most cases, 95% of the variance in the climate variable is captured by fewer than 6 measures. There are large differences between groups probably due to the small sizes (31 respondents in the structural group, 32 in the engineering group for 63 total) (Cronback, 1951). Based on the limited sample, the metrics developed for communications effectiveness, standards and goals and physical environment appear almost as reliable as those created by Secrist and Hackman/Oldham.

TABLE 5

Stepwise Regression of Questionnaire on Communications Effectiveness

Engineering		Structures		Overall	
Question Number	Cumulative R Square	Question Number	Cumulative R Square	Question Number	Cumulative R Square
12	0.72	2	0.63	12	0.67
2	0.81	4	0.83	2	0.80
5	0.91	5	0.89	3	0.87
6	0.93	6	0.92	5	0.90
3	0.95	7	0.94	11	0.92
8	0.96	12	0.97	9	0.94
7	0.97	3	0.98	7	0.95
11	0.98	9	0.98	10	0.97
4	0.98	8	0.99	1	0.98
10	0.99	11	0.99	4	0.99
9	0.99	10	0.99	6	0.99
1	1.00	1	1.00	3	1.00

TABLE 6

Stepwise Regression of Questionnaire on Individual Versus
Organizational Control

Engineering		Structures		Overall	
Question Number	Cumulative R Square	Question Number	Cumulative R Square	Question Number	Cumulative R Square
2	0.60	1	0.74	2	0.65
9	0.77	2	0.83	4	0.76
8	0.87	7	0.87	6	0.83
10	0.94	6	0.90	9	0.83
5	0.96	8	0.91	10	0.91
11	0.98	9	0.93	8	0.93
4	0.98	3	0.95	5	0.95
3	0.98	10	0.97	3	0.97
7	0.98	5	0.98	7	0.98
1	0.99	4	0.99	1	0.99
6	1.00	11	1.00	11	1.00

TABLE 7

Stepwise Regression of Questionnaire on Interpersonal Relations

Engineering		Structures		Overall	
Question Number	Cumulative R Square	Question Number	Cumulative R Square	Question Number	Cumulative R Square
10	0.62	10	0.59	10	0.60
3	0.90	7	0.77	3	0.72
8	0.97	4	0.84	3	0.92
11	0.91	1	0.91	11	0.97
1	0.93	11	0.94	7	0.90
6	0.96	2	0.96	1	0.93
9	0.97	3	0.97	2	0.95
4	0.98	9	0.93	4	0.96
7	0.98	5	0.99	12	0.97
12	0.99	12	0.99	9	0.93
2	0.99	3	0.99	5	0.99
5	1.00	5	1.00	5	1.00

TABLE 3

Stepwise Regression of Questionnaire on Job Characteristics

Engineering		Structures		Overall	
Question Number	Cumulative R Square	Question Number	Cumulative R Square	Question Number	Cumulative R Square
6	0.73	2	0.74	2	0.70
9	0.83	7	0.85	7	0.81
3	0.89	3	0.89	3	0.87
4	0.92	12	0.94	12	0.91
3	0.95	13	0.95	13	0.94
2	0.96	1	0.97	10	0.95
1	0.97	5	0.98	11	0.97
10	0.98	11	0.98	5	0.98
13	0.99	9	0.98	4	0.98
7	0.99	6	0.99	6	0.99
11	0.99	10	0.99	8	0.99
5	0.99	4	0.99	9	0.99
12	1.00	8	1.00	1	1.00

TABLE 9

Stepwise Regression of Questionnaire on Leader-Supervisor Competence

Engineering		Structures		Overall	
Question Number	Cumulative R Square	Question Number	Cumulative R Square	Question Number	Cumulative R Square
12	0.83	12	0.69	12	0.91
14	0.93	7	0.83	14	0.91
2	0.97	4	0.92	2	0.94
6	0.98	9	0.95	3	0.95
7	0.98	1	0.97	1	0.96
8	0.99	14	0.98	7	0.97
3	0.99	15	0.98	6	0.98
1	0.99	5	0.99	3	0.98
13	0.99	13	0.99	16	0.99
5	0.99	10	0.99	5	0.99
16	0.99	8	0.99	13	0.99
15	0.99	11	0.99	15	0.99
10	0.99	3	0.99	4	0.99
4	0.99	6	0.99	10	0.99
11	0.99	16	0.99	9	0.99
9	1.00	2	1.00	11	1.00

TABLE 10

Stepwise Regression of Questionnaire on Personal Needs

Engineering		Structures		Overall	
Question Number	Cumulative R Square	Question Number	Cumulative R Square	Question Number	Cumulative R Square
5	0.51	14	0.54	15	0.44
12	0.71	11	0.74	7	0.69
1	0.85	15	0.83	3	0.31
3	0.91	10	0.88	12	0.33
2	0.93	6	0.91	14	0.90
3	0.95	1	0.94	1	0.92
14	0.96	8	0.95	5	0.93
9	0.97	7	0.96	11	0.94
15	0.97	12	0.93	6	0.96
5	0.93	5	0.93	9	0.97
17	0.93	9	0.99	10	0.97
16	0.93			4	0.93
11	0.99			17	0.93
10	0.99			13	0.99
4	0.99			2	0.99
7	0.99			16	0.99
13	1.00			3	1.00

TABLE 11

Stepwise Regression of Questionnaire on Physical Environment

Engineering		Structures		Overall	
Question Number	Cumulative R Square	Question Number	Cumulative R Square	Question Number	Cumulative R Square
4	0.64	9	0.47	4	0.52
7	0.82	2	0.77	2	0.75
5	0.89	10	0.86	5	0.84
1	0.94	7	0.91	7	0.89
12	0.96	11	0.93	12	0.92
3	0.93	8	0.95	1	0.94
3	0.93	12	0.97	9	0.95
11	0.93	4	0.97	3	0.96
9	0.99	5	0.93	10	0.97
10	0.99	1	0.99	6	0.93
6	0.99	3	0.99	11	0.99
2	1.00	6	1.00	3	1.00

TABLE 12

Stepwise Regression of Questionnaire on Organizational Reward Systems

Engineering		Structures		Overall	
Question Number	Cumulative R Square	Question Number	Cumulative R Square	Question Number	Cumulative R Square
10	0.55	16	0.73	10	0.55
3	0.76	5	0.83	9	0.70
13	0.84	4	0.90	7	0.80
4	0.87	13	0.93	2	0.87
17	0.91	13	0.94	12	0.90
1	0.93	17	0.95	4	0.91
9	0.95	3	0.96	15	0.93
16	0.97	11	0.97	11	0.94
18	0.96	14	0.97	5	0.95
6	0.97	10	0.93	13	0.96
14	0.98	7	0.93	3	0.97
15	0.93	9	0.93	17	0.93
12	0.93	12	0.93	6	0.93
2	0.93	3	0.99	1	0.93
5	0.99	15	0.99	18	0.99
11	0.99	2	0.99	14	0.99
7	0.99	6	0.99	15	0.99
3	1.00	1	1.00	3	1.00

TABLE 13

Stepwise Regression of Questionnaire on Standards and Goals

Engineering		Structures		Overall	
Question Number	Cumulative R Square	Question Number	Cumulative R Square	Question Number	Cumulative R Square
11	0.76	3	0.45	11	0.59
3	0.85	11	0.64	3	0.73
9	0.90	7	0.75	7	0.84
7	0.93	2	0.81	9	0.83
9	0.95	9	0.87	2	0.92
2	0.97	10	0.90	10	0.94
10	0.97	8	0.93	3	0.96
4	0.93	4	0.95	4	0.97
6	0.99	6	0.99	6	0.99
5	0.99	1	0.99	5	0.99
1	1.00	5	1.00	1	1.00

TABLE 14

Stepwise Regression of Questionnaire on Stress

Engineering		Structures		Overall	
Question Number	Cumulative R Square	Question Number	Cumulative R Square	Question Number	Cumulative R Square
4	0.76	2	0.74	2	0.72
3	0.87	12	0.85	12	0.82
10	0.91	3	0.90	7	0.83
12	0.94	5	0.93	3	0.92
7	0.96	10	0.94	4	0.94
6	0.97	6	0.96	10	0.95
5	0.98	9	0.97	6	0.96
9	0.93	3	0.93	9	0.97
1	0.98	1	0.93	5	0.98
2	0.99	7	0.99	1	0.99
8	0.99	4	0.99	3	0.99
11	1.00	11	1.00	11	1.00

CONTRIBUTIONS, FURTHER RESEARCH AND CONCLUSIONS

This section discusses the significant contributions of this research; suggests areas where this research could be expanded, extended or modified and includes concluding remarks.

Contribution

Individual attitude questionnaire. The survey questionnaire used in this research combined research from many sources into a single instrument to measure the full climate of organizations. The portions measuring communications effectiveness, standards and goals and physical environment are now available and consistent with previously defined metrics.

Preliminary behavior rules. The behavior rules written as application methods in the expert system demonstrate a procedure for transforming behavioral findings into if-then production rules. This procedure may be expanded into other research areas for use in future expert systems.

Knowledge representation. The expert system developed in this research displays a workable structure representing individuals and organizations in a computer knowledge base. The controller system, application methods and validation technique are suitable for a large variety of expert system applications.

Future Research

This research prompted consideration of several areas of further research to improve and expand the prototype expert system.

Questionnaire improvement. The attitude questionnaire is somewhat lengthy. Further testing of the survey may make it possible to reduce the number of questions without significant loss in reliability.

Alternate performance measures. The consultant was validated using changes in performance since the absolute values of performance may not be comparable between organizations. Additional research relating performance to measurable productivity may substantiate the expert system's findings and give improved feedback (Tuttle, 1986).

Sensitivity analysis. A behavior rule contributes to individual performance only if the preconditions are met. A sensitivity of the rules and precondition variables may give valuable insight into the importance of specific variables and/or rules.

Weighting of values. When the consultant aggregated values for climate and performance variables, the values were equally weighted (with the exception of OVERALL.PERFORMANCE which weighted organizational measures according to the weights managers assigned).

Currently, the attitudes of high performers and low performers are considered equally. Further research could improve this situation.

Additional behavioral research may show ideal weighting factors for specific work domains. This was, in fact, the goal of Secrist's work from 1976 to 1981 which established the climate measures for research scientists. (G.E. Secrist, personal communication, May 30, 1987.) Using the consultant with a variety of organizations may facilitate the establishment of such weights.

The consultant could also be used in conjunction with the productivity measures and sensitivity analysis to adjust its own weights in a recursive fashion. This technique may help formulate the nonlinear weighting schemes proposed by Naylor, Pritchard and Ilgen (1980).

Development of situational variables. Variables identified as affected by the hypothetical situations used to validate the model were selected by careful consideration and knowledge of the attributes and their meanings. The typical user would not be able to categorize the most appropriate variables for a given situation. A natural language interface with a parser specifically designed for behavior issues may be able to categorize variables for situational analysis.

Validation group. In the validation process, managers made predictions based on their perceptions of their employees. The consultant calculated predictions based on the employee's own perceptions and attitudes. The disparity between these two points

of view could be reduced by surveying all employees about the hypothetical situations in lieu of just the managers.

Use of volition. Secrist's total spectrum model of human performance and organizational effectiveness (see Figure 6) translates human abilities (mental, physical, experience, volition and other factors) through job characteristics and climate variables into performance measures. The model used in the prototype (see Figure 11) reduced the human abilities portion to simply human attitudes. The volition of the employee (the willingness to act in a given circumstance) is probably the next attribute to measure and add to the reduced model. An employee may have desire, motivation and the right work climate but may not perform without volition.

Conclusions

This research shows it is possible to represent organizational climate in an expert system and predict performance using known behavioral research findings. The consultant can evaluate the effects of changes in attitude upon performance and help managers make more informed decisions.

Several thought provoking ideas about the use of automated behavior analysis and its application in the work place resulted from this research.

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APPENDIX 1

BEHAVIOR FINDINGS

This appendix paraphrases select behavioral research findings as preliminary rules which can be used to evaluate performance. A general statement of the rule is given with its source. Variables in parenthesis are the corresponding variables used in the expert system. The transformation of these rules into if-then phraseology for the expert system is in Appendix 14.

Autonomy Creativity

Where employees have control over work methods (IND.ORG. CONTROL) and while there is a need for creativity (SKILL.VARIETY. INDEPENDENT.THUGHT), there is increased innovation (EXCELLENCE, REALIZATION.OF.POTENTIAL).

(Patchen, 1970)

Autonomy Growth

Behavior is dominated by the most basic group of unsatisfied needs. If autonomy is low (IND.ORG.CONTROL) and chances for growth are low (GROWTH.DEVELOP) then satisfaction will be low (NEED.FULFILLMENT, SELF.REALIZATION).

(Maslow, 1970)

Challenge Opportunity

Challenging work (JOB.CHALLENGE) and opportunity to use valued abilities (GROWTH.DEVELOPMENT.HO) are found to be important in retention decisions (call it loyalty) (ACHIEVEMENT, NEED.FULFILLMENT).

(Mosbach and Scanlan, 1979)

Challenge Responsibility

Challenging work (JOB.CHALLENGE) should be coupled with liberal responsibility (IND.ORG.CONTROL) for best performance (ACHIEVEMENT).

(Schultz, 1970)

Challenge Satisfaction

Job challenge (JOB.CHALLENGE) is a primary determinant of job satisfaction (NEED.FULFILLMENT, SELF.REALIZATION, JOB.SATISFACTION).

(Walsh, Taber and Beehr, 1980; Schneider and Hall, 1972)

Cohesive Accept

Highly cohesive groups (COHESIVE) are above average in performance (ACHIEVEMENT, EFFECTIVENESS, EFFICIENCY, REALIZATION.OF.POTENTIAL) when the group accepts the organization's goals (STANDARDS.GOALS).

(Seashore, 1954)

Cohesive Goals

Cohesive groups (COHESIVE) generally demonstrate universal participation (EFFECTIVE.PARTICIPATION), have clear, understandable objectives (STANDARDS.GOALS); have frank, open communications (COMM.EFFECTIVENESS); have integrated values and needs (REWARD.SYS); share mutual influence (LACK.OF.INFLUENCE); and are willing to deal with conflict (STRESS).

(Likert, 1961; McGregor, 1960)

Cohesive Identify

Cohesiveness (COHESIVE) is linked to identification with the work organization (REALIZATION.OF.POTENTIAL).

(Patchen, 1970)

Cohesive Non-Accept

Highly cohesive groups (COHESIVE) perform below average (ACHIEVEMENT, EFFECTIVENESS, EFFICIENCY, REALIZATION.OF.POTENTIAL) if the group does not accept the organizational goals (STANDARDS.GOALS).

(Seashore, 1954)

Cohesive Productive

Cohesive groups (COHESIVE) are typically more productive (ACHIEVEMENT, EFFECTIVENESS).

(Mills, 1967)

Communications Effectiveness

The communications system (COMM.EFFECTIVENESS) ties together efficiency and resource use (EFFICIENCY).

(Berlo in Farace and MacDonald, 1974)

Commitment Communications

Groups with greater commitment to goals (STANDARDS.GOALS), more open communication (COMM.EFFECTIVENESS) and more friendly interpersonal relations (INTERPERSONAL.REL) manifest cohesiveness (COHESIVE).

(Secrist, 1981)

Distrust

In a highly participative environment (EFFECTIVE.PARTICIPATION), if there is distrust (TRUST), it destroys concerted actions (SELF.REALIZATION).

(Rosenfeld and Smith, 1967)

External Control

External control (IND.ORG.CONTROL) is less effective because it contributes to psychological withdrawal (call it job interest) (ACHIEVEMENT, EFFICIENCY, JOB.SATISFACTION) and diminishes willingness to contribute (call it job attitude) (NEED.FULFILLMENT, ACHIVEMENT).

(Argyris, 1972)

Fulfillment Growth

Higher order need gratification (NEED.FULFILLMENT) is related to the autonomy of the job (IND.ORG.CONTROL) and the growth experiences of the job (GROWTH.DEVELOPMENT).

(Lawler and Hall, 1970)

Interest Supervisor

Interesting work (SKILL.VARIETY.HO, JOB.CHALLENGE) and a good supervisor (LEADER.SUPER) produce job satisfaction (JOB.SATISFACTION) and efforts at efficiency (EFFICIENCY).

Interpersonal Relations

Participation in decision making across work groups and within work groups (INTERPERSONAL.REL) results in increased involvement and commitment (ACHIEVEMENT, REALIZATION.OF.POTENTIAL, JOB.SATISFACTION, NEED.FULFILLMENT).

(Drake and Mitchell, 1978)

Involvement

Job involvement (INVOLVEMENT, NEED.FOR.INVOLVEMENT) is a potent moderator of organizational environment (PHYSICAL.ENVIR) and individual satisfaction (JOB.SATISFACTION, NEED.FULFILLMENT).

(Batlis, 1978)

Lack of Stress

Total lack of job stress (STRESS) may cause a negative deviation from nominal functioning (ACHIEVEMENT, EFFICIENCY, EFFECTIVENESS, REALIZATION.OF.POTENTIAL).

(Beehr and Newman, 1978; Schuler, 1980; Wherry and Curran, 1966)

Leader Climate

Leader behavior (LEADER.SUPER) and organizational climate (OVER.ALL.CLIMATE) contribute to increased accidents and injury (EFFICIENCY, EFFECTIVENESS, JOB.SATISFACTION, REALIZATION.OF.POTENTIAL).

(Butler and Jones, 1979)

Meaningful Work

If work is meaningful (SKILL.VARIETY.HO, TASK.IDENTITY, TASK.CONTINUITY, TASK.SIGNIFICANCE) in an autonomous environment (IND.ORG.CONTROL) and offering appropriate rewards (REWARD.SYS) then workers will be highly motivated (JOB.SATISFACTION, NEED.FULFILLMENT, ACHIEVEMENT, EFFECTIVENESS, EFFICIENCY, REALIZATION.OF.POTENTIAL).

(Hackman and Oldham, 1975, 1976)

Motivation Skill Use

Job motivation (JOB.MOTIVATION) is proportional to use of skills (SKILL.VARIETY), individual control of work (IND.ORG.CONTROL) and feedback (REWARD.SYS).

(Hackman and Oldham, 1980)

Overall Climate

The job setting and organizational environment (OVER.ALL. CLIMATE) is a primary source of need satisfaction (NEED. FULFILLMENT).

(Secrist, 1981)

Participation Involvement

Participative management can be effective to instill a sense of involvement (JOB.SATISFACTION) and meet higher order needs (NEED.FULFILLMENT, SELF.REALIZATION).

(Rosenfeld and Smith, 1967)

Participation

Employee participation (EFFECTIVE.PARTICIPATION) improves job attitudes (ACHIEVEMENT, NEED.FULFILLMENT) and performance (ACHIEVEMENT, EFFECTIVENESS, EFFICIENCY, REALIZATION.OF.POTENTIAL).

(Chaney, 1969; Schefflen, Lawler and Hackman, 1971; Vroom, 1963)

Reward Importance

There is a strong link between reward importance (IMPORTANCE. OF.REWARD), job feedback (REWARD.SYS) and job performance (ACHIEVEMENT, EFFECTIVENESS, EFFICIENCY, REALIZATION.OF.POTENTIAL).

(Lawler, 1967)

Reward Needs

The equity theory says people attempt to balance input effort with the rewards they receive. High expectations (EXPECTATION.OF.REWARDS) and high importance of receiving rewards (IMPORTANCE.OF.REWARDS) prompts higher work effort (ACHIEVEMENT, REALIZATION.OF.POTENTIAL, JOB.SATISFACTION, NEED.FULFILLMENT).

(Adams, 1965; Mitchell, 1979; Porter and Lawler, 1968)

Reward Role Clarity

Feedback (REWARD.SYS) is amplified under conditions of role clarity (ROLE.CONFLICT). Job satisfaction (ACHIEVEMENT, REALIZATION.OF.POTENTIAL, JOB.SATISFACTION, NEED.FULFILLMENT) appears to increase when goals are established.

(Mitchell, 1979)

Reward Work

If hard work leads to fair rewards (REWARD.SYS), then people work harder (expectancy theory) (ACHIEVEMENT, EFFECTIVENESS, EFFICIENCY, REALIZATION.OF.POTENTIAL).

(Lawler, 1970; Porter, Lawler, 1968; Mitchell, 1979)

Rewards Self-Esteem

Improved intrinsic rewards (INTRINSIC.REWARD) led to a feeling of self-esteem (JOB.SATISFACTION, SELF.REALIZATION), accomplishment (ACHIEVEMENT) and self-fulfillment (NEED.FULFILLMENT).

(Lawler, 1969)

Role Clarity

Lack of role clarity (ROLE.CONFLICT) is substantially related to job tensions, turnover and proclivity to leave the job (JOB.SATISFACTION).

(Lyons, 1971)

Satisfaction Communications Achievement

When employees are satisfied with communications (COMM.EFFECTIVENESS), they show a positive attitude towards management (ACHIEVEMENT, NEED.FULFILLMENT), are more satisfied with their supervisors (JOB.SATISFACTION) and identify more with the organization (REALIZATION.OF.POTENTIAL).

(Huchinsky, 1977)

Satisfaction Communications

Job satisfaction (JOB.SATISFACTION) is related to a number of communications variables (COMM.EFFECTIVENESS).

(Roberts and O'Reilly, 1974)

Satisfaction Role Clarity

Job satisfaction (JOB.SATISFACTION) increases when clear goals (ROLE.CONFLICT), goal planning (STANDARDS.GOALS), support and autonomy (IND.ORG.CONTROL), job security (STRESS), development of capabilities (GROWTH.DEVELOPMENT) and a performance contingent reward system (REWARD.SYS) are present.

(Zultowski, Avery and Dewhirst, 1973)

Standards Autonomy

Formalization and standardization (STANDARDS.GOALS) diminish satisfaction (JOB.SATISFACTION) when there is a lack of autonomy (IND.ORG.CONTROL).

(James and Jones, 1976)

Standards Challenge

Specific goals (STANDARDS.GOALS) and challenging work (JOB.CHALLENGE) regulate performance (ACHIEVEMENT, EFFECTIVENESS, EFFICIENCY, REALIZATION.OF.POTENTIAL).

(Locke, 1968, 1975)

Standards Communications

Formalization, standardization (STANDARDS.GOALS) and lack of ambiguity (COMM.EFFECTIVENESS) are positively related to satisfaction (JOB.SATISFACTION).

(James and Jones, 1976)

Standards Expectant Reward

Clear challenging goals (STANDARDS.GOALS), reward distribution (REWARD.SYS) and expectations (EXPECTATION.OF.REWARDS) increase performance (ACHIEVEMENT, EFFECTIVENESS, EFFICIENCY, REALIZATION.OF.POTENTIAL).

(Mitchell, 1979)

Standards

Persons with assigned goals (STANDARDS.GOALS) produced (ACHIEVEMENT, EFFECTIVENESS) more than those without assigned goals.

(White, Mitchell and Bell, 1977)

Standards Rewards

Incentives and rewards (REWARD.SYS) are more readily linked with performance goals (ACHIEVEMENT, EFFECTIVENESS, EFFICIENCY, REALIZATION.OF.POTENTIAL) when goals are well defined (STANDARDS.GOALS).

(Kirchhoff, 1975; Locke, 1968, 1975)

Stress Frustration

Frustration (STRESS) leads to reduced productivity and lower morale (EFFECTIVENESS, ACHIEVEMENT, NEED.FULFILLMENT).

(Lawrie, 1967)

Stress Health

Job stress (STRESS) provides a maladaptive response through adverse effects on physical health (EFFICIENCY), mental health (EFFECTIVENESS) and performance (ACHIEVEMENT, EFFECTIVENESS, EFFICIENCY, REALIZATION.OF.POTENTIAL).

(McLean, 1974)

Stress Satisfaction

An employee's mental health (STRESS) varies consistently with job satisfaction (JOB.SATISFACTION).

(Kornhauser, 1965)

Stress Turnover

Excess stress (STRESS) has symptoms of changed work performance, high turnover, absenteeism, lateness (ACHIEVEMENT, NEED.FULFILLMENT).

(Schuler, 1980; Margolis and Kroes, 1974)

Support Communications Teamwork

Mutual trust and support (ADEQUATE.ENVIRONMENT, IND.ORG.CONTROL, INTERPERSONAL.REL), honest and open communications (COMM.EFFECTIVENESS), intrinsic motivation (INTRINSIC.REWARD), equalization of power (PERSONAL.REL.COMPETENCE), teamwork (TEAMWORK), individual control over methods (IND.ORG.CONTROL), meaningful participation (EFFECTIVE.PARTICIPATION) and bidirectional influence (TASK.COMPETENCE, INFLUENCE.ENVIRONMENT) are all critical to individual growth (SELF.REALIZATION), achievement (ACHIEVEMENT), excellence (EXCELLENCE), and organizational effectiveness (EFFECTIVENESS).

(Argyris, 1964, 1971, 1975; Bass, 1971; Bennis, 1966; Katz and Kahn, 1966; Likert, 1961, 1967; Maslow, 1965, 1970; McGregor, 1960, 1967)

Teamwork

Pride in group effectiveness (TEAMWORK) enhances cohesiveness (COHESIVE).

(Newcomb, Turner, and Converse, 1955)

Trust Supervisor

Employees who trust their supervisor (LEADER.SUPER) identify better with the organization (REALIZATION.OF.POTENTIAL).

(Muchinsky, 1977)

Two Way Comm.

Greater organizational effectiveness (EFFECTIVENESS) is found when open, two-way communications exist (COMM.EFFECTIVENESS).

(Rubin and Goldman, 1969)

APPENDIX 2

COMMUNICATIONS EFFECTIVENESS

These variables measure the perceived quality of communications within the organization (COMM.EFFECTIVENESS). "[They] reflect the extent to which organizational and interpersonal communications are accurate, undistorted, unbiased, and complete [and the] degree to which open, honest, easy two-way information exchange exists between organization members and the leadership or management" (Secrist, 1981). Three main categories of communications are addressed: production communication, maintenance communication and innovation influence (Berlson and Steiner, 1964). The respondents were asked to circle the number that best described their agreement or disagreement with the statements provided.

1.....2.....3.....4.....5.....6.....7

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
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ACCURATE.COMM

1. The communications, directions and instructions I receive about my work are correct and accurate (Muchinsky, 1977; Klauss, 1977).

ANSWERS.AVAIL

2. It's easy to get answers in my organization (Farace and MacDonald, 1974).

AVAIL.INFO

3. The information I need to do my work is available when I need it (Farace and MacDonald, 1974).

BELIEVABLE.COMM

4. When I am told something concerning the work I am doing, I can believe it (Muchinsky, 1977; Klauss, 1977).

CONVINCING

5. I can convince others to my way of thinking (Berlson and Steiner, 1964).

CORRESP.TIMELY

6. In my organization, correspondence and periodic reports are done on time (Roberts and O'Reilly, 1974).

FREEDOM.OF.SPEECH

7. I can criticize someone or something, if necessary, without getting in trouble (Farace and MacDonald, 1974).

INFLUENCE.OTHERS

8. When I say something, people listen (Berleson and Steiner, 1964).

INFO.AVAIL

9. I can find out the information I need to do my job (Farace and MacDonald, 1974).

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7. I can criticize someone or something, if necessary, without getting in trouble (Farace and MacDonald, 1974).

INFLUENCE.OTHERS

8. When I say something, people listen (Berleson and Steiner, 1964).

INFO.AVAIL

9. I can find out the information I need to do my job (Farace and MacDonald, 1974).

OPEN.COMMUNICATIONS

10. I can say anything I want about my job to my supervisors (Farace and MacDonald, 1974).

REPORTS.TIMELY

11. Routine paperwork gets done without being delayed (Roberts and O'Reilly, 1974).

SATISFIED.COMM

12. I am satisfied with the way I find out the things I need to know (Farace and MacDonald, 1974).

APPENDIX 3

INDIVIDUAL VERSUS ORGANIZATIONAL CONTROL VARIABLES

These variables measure the perceived level of autonomy or individual control within the organization (IND.ORG.CONTROL). "[They] reflect the extent that behavior is controlled by the organization vis a vis the individual. [They] relate to the degree of organizational control, structure, or stringency of policies, rules, and regulations vis a vis self-control, flexibility, independence, or autonomy" (Secrist, 1981). The questions were developed by Secrist, McNee and Paden (1983). The respondents were asked to circle the number that best described their agreement or disagreement with the statements provided.

1.....2.....3.....4.....5.....6.....7

Strongly	Disagree	Slightly	Neutral	Slightly	Agree	Strongly
Disagree		Disagree		Agree		Agree

BELONGING

1. I am made to feel an essential part of the work group.

FAIRNESS

2. My suggestions and recommendations are considered fairly.

LEVEL.SUPERVISION*

3. My work is very closely supervised.

*Reverse measures of autonomy.

MANAGEMENT.RESPONS

4. I think management is responsive to my suggestions.

MANAGEMENT.SUPPORT

5. When I make a decision, my boss backs me up.

OPEN.EXPRESSION

6. I can express my feelings freely.

PARTICIPATION.DECISIONS

7. I am provided with the opportunity to participate in job related decisions.

PARTICIPATION.POLICY

8. I am given the opportunity to participate in the formulation of policy in my area.

PERSONAL.JUDGEMENT*

9. I am seldom able to use my own judgement in performing my work.

RESTRICTIONS*

10. The procedures and regulations which govern my work are too restrictive.

TRUST

11. My boss trusts me to do a good job.

*Reverse measures of autonomy.

APPENDIX 4

INTERPERSONAL RELATIONS VARIABLES

These variables measure the perceived quality of interpersonal relations between members of the organization (INTERPERSONAL.REL).

"[They] pertain to the quality and supportiveness of relations among peers, subordinates, superiors, work groups, interfacing subunits, and organizations [and the] degree of work group or team cohesiveness and solidarity is included within this dimension" (Secrist, 1981). The questions were developed by Secrist, McNee and Paden (1983). The respondents were asked to circle the number that best described their agreement or disagreement with the statements provided.

1.....	2.....	3.....	4.....	5.....	6.....	7
Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree

CARE.OF.PEOPLE

1. The work group I work with takes care of its people.

COMPLAINTS*

2. My fellow workers complain about the work they do.

*Reverse measures of interpersonal relations.

DESIRE.CHANGE*

3. Most of my fellow workers would like to get transferred or change jobs.

DISSATISFACTION

4. My dissatisfaction with my work group is too small to mention.

ENJOYMENT

5. I enjoy working with the people in my work group.

GET.ALONG

6. Members of my work group get along well together.

GROUP.COORD

7. In my job, we work together as a highly coordinated team.

GROUP.PLEASURE*

8. The group I work with takes no great pleasure in doing their work.

MANAGEMENT.CONCERN

9. I think management is concerned about the working environment.

QUARREL*

10. Some members of this group quarrel a lot and have bad feelings towards each other.

*Reverse measures of interpersonal relations.

TENSION*

11. There are tensions between some individuals which interfere with the effectiveness of the group.

UNCOOPERATIVE*

12. Certain members of the work group are uncooperative.

*Reverse measures of interpersonal relations.

APPENDIX 5

JOB CHARACTERISTICS EVALUATION VARIABLES

These variables measure perceived characteristics of a person's job. The evaluation questions were developed by Hackman and Oldham (1980) (JOB.EVALUATION). The respondents were asked to circle the number that best described their agreement or disagreement with the statements provided.

1.....2.....3.....4.....5.....6.....7

Strongly
Disagree

Disagree

Slightly
Disagree

Neutral

Slightly
Agree

Agree

Strongly
Agree

BREADTH.SIGNIFICANCE

1. Lots of people can be affected by how well my work gets done.

ENJOY.CHALLENGE

2. I enjoy the challenge of my work.

GROWTH

3. I am really satisfied with the amount of personal growth and development that I get in doing my work.

INDEPENDENT.THUGHT

4. I have a lot of independent thought and action associated with my work.

MEANINGFUL.WORK

5. The work I do on my job is very meaningful to me.

PERSONAL.ACCOMPLISHMENT

6. I get a feeling of worthwhile accomplishment from doing this job.

REPETITIVE*

7. My job is simple and quite repetitive.

SELF.FEEDBACK

8. I can tell by examining my work if I am doing a good job or not.

SKILL.VARIETY

9. My job requires me to do many different things and use a large variety of my skills and talents.

STIMULATING.WORK*

10. I would like to have more stimulating and challenging work.

TASK.IDENTITY

11. I feel I should take the credit or blame for the results of my work on the job.

TASK.SIGNIFICANCE

12. If I do not do my job well, it could cause lots of problems.

*Reverse measure of job characteristics.

TRIVIAL.WORK*

13. Most of the things I have to do on this job seem useless or trivial.

*Reverse measure of job characteristics.

APPENDIX 6

LEADER/SUPERVISOR COMPETENCE VARIABLES

These variables measure the perceived competence of the immediate leader or work supervisor (LEADER.SUPER). The questions were developed by Secrist, McNee and Paden (1983). The respondents were asked to circle the number that best described their agreement or disagreement with the statements provided.

1.....2.....3.....4.....5.....6.....7

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
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SUP.ACCEPTANCE

1. My supervisor accepts me for what I am.

SUP.APPRECIATIVE

2. My supervisor appreciates the work I do.

SUP.CONFIDENT

3. My supervisor is confident of his ability.

SUP.CONSIDERATE

4. My supervisor is considerate.

SUP.CONVINCING

5. My supervisor is convincing.

SUP.COOPERATIVE

6. My supervisor is cooperative.

SUP.DECISIVE

7. My supervisor makes decisions easily.

SUP.EFFECTIVE

8. My supervisor is very effective (knows what job needs to be done.)

SUP.EFFICIENT

9. My supervisor is very efficient (does a lot in a short time and does not waste time or materials).

SUP.ENCOURAGING

10. My supervisor is encouraging.

SUP.FAIR

11. My supervisor is fair.

SUP.HELPFUL

12. My supervisor is helpful.

SUP.IMAGINATIVE

13. My supervisor is imaginative and creative.

SUP.LEADER

14. My supervisor is a leader.

SUP.PRODUCTIVE

15. My supervisor is very productive (gets a lot of the right jobs done).

SUP.SUPPORTIVE

16. My supervisor supports me in the work I do.

APPENDIX 7

PERSONAL NEEDS VARIABLES

These variables measure the individual's desire for certain types of recognition or rewards (PERSONAL.NEEDS). The questions are related to those of the organizational reward system in Appendix 9 (Storist, McNee and Paden, 1983). The respondents were asked to circle the number that best described their agreement or disagreement with the statements provided.

1.....2.....3.....4.....5.....6.....7

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
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NEED.FOR.ADVANCEMENT

1. I want to advance to more important work.

NEED.FOR.CHALLENGE

2. I would like to have more challenging work assignments.

NEED.FOR.COMPETENCE

3. I want to be considered competent.

NEED.FOR.COMPLIMENTS

4. I want more compliments, recognition and praise.

NEED.FOR.DIFFICULT.WORK

5. I want to have more difficult work assignments.

NEED.FOR.FEEDBACK

6. I want more feedback so I will know more about how I am doing on the job.

NEED.FOR.IMPRESSION

7. I want my supervisor to be impressed with my work.

NEED.FOR.INFLUENCE

8. I want to have greater influence with my supervisors.

NEED.FOR.INVOLVEMENT

9. I want to help make important decisions.

NEED.FOR.JOB.SECURITY

10. I want increased job security.

NEED.FOR.LESS.SUPERVISION

11. I want my supervisors to check my work less often.

NEED.FOR.PAY.TIME

12. I want higher pay or more time off.

NEED.FOR.PERFORMANCE

13. I want to have better performance ratings.

NEED.FOR.PROMOTION

14. I want to receive faster promotions.

NEED.FOR.RESPONS

15. I would like to have more responsibility.

NEED.FOR.SELF.CONTROL

16. I want to be able to decide how to accomplish my work.

NEED.FOR.VOLUME

17. I want a greater volume of work.

APPENDIX 8

PHYSICAL ENVIRONMENT VARIABLES

These variables measure the perceived conditions of the working environment (PHYSICAL.ENVIR). "[They] refer to the quality, adequacy, and supportiveness of the immediate work space or facilities. [They] reflect the extent to which the physical-architectural work space conforms to individual choice; and the degree to which the individual is free to modify or adapt the immediate physical-architectural work space to suit personal characteristics and preferences" (Secrist, 1931). Three elements of the physical environment (space, equipment and money) are evaluated in two categories: availability and flexibility (Secrist, 1974). The respondents were asked to circle the number that best described their agreement or disagreement with the statements provided.

1.....2.....3.....4.....5.....6.....7

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
----------------------	----------	----------------------	---------	-------------------	-------	-------------------

ADDITIONAL.EQUIPMENT

1. If I needed new equipment to do my job better, I can ask for it and may get it.

ADDITIONAL.MONEY

2. If I could improve my work by spending a little more money on something, I can ask for it and may get it.

ADEQUATE.MONEY

3. There seems to be enough money available in my organization to pay for the things which I need to do a good job.

ADEQUATE.WORK.SPACE

4. The facilities I use to do my work provide adequate workspace and appropriate working conditions.

ADJUSTABLE.SURROUNDINGS

5. I can change the arrangement and appearance of my work surroundings if I want to.

APPROPRIATE.PLACE

6. The place where I work is appropriate for the work I do.

AVAIL.MONEY

7. When something happens and there is a special need for extra money to do my job correctly, the money is available.

CORRECT.EQUIP

8. The equipment I use in my job is the right kind to do the work I do.

ENOUGH.EQUIPMENT

9. I have enough of the equipment I need to do my job well.

EQUIPMENT.USE

10. I can influence how the equipment in my organization is used.

FLEXIBLE.SURROUNDINGS

11. If I needed more space to do my work or wanted to rearrange the work location, I could ask and get it.

INFLUENCE.SPENDING

12. I can influence the way the money is spent in my organization.

APPENDIX 9

ORGANIZATIONAL REWARD SYSTEM VARIABLES

These variables measure the perceived rewards given in recognition for good work (REWARD.SYS). "[They] concern the quality, quantity, and equity of rewards or incentives. [They] also include the extent to which rewards are contingent on level of performance and contribution to the organization" (Secrist, 1931). The questions were developed by Secrist, McIlree and Paden (1931) except as noted. The questions relate to the personal needs variables in Appendix 7. The respondents were asked to circle the number that best described their agreement or disagreement with the statements provided.

1.....2.....3.....4.....5.....6.....7

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
----------------------	----------	----------------------	---------	-------------------	-------	-------------------

ADVANCEMENT

1. If I do well, I will have a chance to advance to more important work.

CHALLENGING WORK

2. If I do well, I will receive more challenging work assignments.

COMPETENT

3. If I do well, I will be considered competent.

COMPLIMENTS

4. If I do well, I will receive compliments, recognition and praise.

DIFFICULT.WORK.REWARD

5. If I do well, I will be assigned more difficult work assignments.

FEEDBACK

6. My supervisor always lets me know how I am doing.

GROUP.FEEDBACK

7. Most of the people in my work group know how well they are performing their work.

IMPRESSIVE.WORK

8. If I do well, my supervisor will be impressed by my work.

INFLUENCE

9. If I do well, I will have greater influence with my superiors.

INVOLVEMENT

10. If I do well, I will become involved in making important decisions.

JOB.SECURITY

11. If I do well, I will have increased job security.

LESS.SUPERVISION

12. If I do well, my supervisors will check on my work less often.

PAY.TIME

13. If I do well, I will receive higher pay or more time off.

PERFORMANCE.RATING

14. If I do well, I will get better performance ratings.

PROMOTION

15. If I do well, I will receive faster promotions.

RESPONSIBILITY

16. If I do well, I can expect greater responsibility.

SELF.CONTROL

17. If I do well, I will be able to decide how to organize, plan and accomplish my work.

VOLUME.WORK

18. If I do well, I will be given a greater volume of work.

APPENDIX 10

STANDARDS AND GOALS VARIABLES

These variables measure the perceived standards and goals of the organization (STANDARDS.GOALS). They represent the "degree of challenge of goals, objectives, and work [and] the level of difficulty and clarity of goals and standards" (Secrist, 1931). The categories include: challenging objectives, worthwhile goals, meaningful work, and understandable standards. The respondents were asked to circle the number that best described their agreement or disagreement with the statements provided.

1.....2.....3.....4.....5.....6.....7

Strongly	Disagree	Slightly	Neutral	Slightly	Agree	Strongly
Disagree		Disagree		Agree		Agree

ABILITY.TO.DO.WORK

1. I have the ability, skill and knowledge to do the work assigned to me.

WORTH.WORTH

2. I understand and agree with the overall goals and objectives of my organization (Umstot, Mitchell and Bell, 1978).

CONFUSED.EXPECTATIONS*

3. I am not always sure what is expected of me.

*Reverse measures of standards and goals.

DIFFICULT.WORK

4. The work I do is difficult and uses all of my abilities (Locke, 1968, 1975).

GOAL.ACHIEVEMENT

5. I really feel good when I meet or exceed the goals and standards of my organization (Locke, 1968, 1975).

KNOWLEDGE.OF.JOB

6. I know a lot about my job.

NEEDED.WORK

7. The work I do really needs to be done.

NEGLECTED.WORK*

8. Sometimes I think there is important work in my organization that is being neglected.

OVERLOADED*

9. I have so much to do, I rarely get things done on time.

TASK.CONTINUITY

10. I always finish the work I start (Hackman and Oldham, 1980).

WORK.IDENTITY

11. When I finish an assignment, others know how good of a job I did (Hackman and Oldham, 1980).

*Reverse measures of standards and goals.

APPENDIX 11

ORGANIZATIONAL STRESS VARIABLES

These variables measure the perceived dysfunctional stress in an organization (STRESS). They measure "the quantity and type of stress induced by the organization including role conflict, role ambiguity, interpersonal friction, management pressure, and other sources of dysfunctional stress within the work environment" (Secrist, 1931). The questions were developed by Secrist, Helles, and Paden (1983). The respondents were asked to circle the number that best described their agreement or disagreement with the statements provided.

1.....	2.....	3.....	4.....	5.....	6.....	7
Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree

APPEAR.BUSY

1. In my job, I have to always look busy.

CONFLICT.ASSIGNMENT

2. I frequently receive conflicting work assignments.

CONFLICT.DEMANDS

3. I am not able to satisfy the conflicting demands of management.

CONFLICT.VALUES

4. I am frequently expected to do things against my better judgement.

CONFUSED.PLANNING

5. Confusion exists in the planning and organization of work projects.

INFORMATION.AVAIL*

6. I can always get the information I need to do my job well.

LACK.OF.AUTHORITY*

7. I am given enough authority to carry out the work I am responsible for.

LACK.OF.INFLUENCE

8. I am not able to influence the decisions that affect me.

PRESSURE

9. This organization generates a lot of pressure.

UNCLEAR.RESPONS

10. My exact responsibilities on the job are unclear.

UNNECESSARY.ATTEN

11. The management of this organization spends too much attention on unimportant details.

USE.OF.RESOURCES

12. This organization's way of using resources (men, money and material) is frustrating.

*Reverse measures of stress.

APPENDIX 12

INTERMEDIATE VARIABLES

This appendix lists variables used by the expert system as intermediate values. Some of the intermediate variables are combinations of specific individual attitudes. Some are a result of behavior rules applied to other variables. The intermediate variables are listed with their derivation.

<u>Intermediate Variables</u>	<u>Derivation</u>
<u>ADEQUATE.ENVIRONMENT</u>	Average of: <u>APPROPRIATE.PLACE</u> <u>AVAIL.MONEY</u> <u>CORRECT.EQUIP</u> <u>ADEQUATE.WORK.SPACE</u> <u>ADEQUATE.MONEY</u> <u>ENOUGH.EQUIPMENT</u>
<u>COHESIVE</u>	From application of <u>COHESIVE.GOALS</u> rule and <u>TEAMWORK</u> rule
<u>EFFECTIVE.PARTICIPATION</u>	Average of: <u>PARTICIPATION.DECISIONS</u> <u>PARTICIPATION.POLICY</u>
<u>EXPECTATION.OF.REWARDS</u>	Average of: <u>ADVANCEMENT</u> <u>RESPONSIBILITY</u> <u>PROMOTION</u> <u>PERFORMANCE.RATING</u> <u>SELF.CONTROL</u>
<u>EXTRINSIC.REWARD</u>	Average of: <u>INFLUENCE</u> <u>IMPRESSIVE.WORK</u> <u>PERFORMANCE.RATING</u> <u>COMPLIMENTS</u> <u>PROMOTION</u> <u>COMPETENT</u> <u>PAY.TIME</u> <u>JOB.SECURITY</u> <u>LESS.SUPERVISION</u> <u>FEEDBACK</u> <u>GROUP.FEEDBACK</u>

<u>GROWTH.DEVELOP</u>	Average of:	GROWTH PERSONAL.ACCOMPLISHMENT ENJOY.CHALLENGE INDEPENDENT.THUGHT STIMULATING.WORK
<u>IMPORTANCE.OF.REWARDS</u>	Average of:	NEED.FOR.ADVANCEMENT NEED.FOR.RESPONS NEED.FOR.PROMOTION NEED.FOR.PERFORMANCE NEED.FOR.SELF.CONTROL
<u>INFLUENCE.ENVIRONMENT</u>	Average of:	FLEXIBLE.SURROUNDINGS INFLUENCE.SPENDING EQUIPMENT.USE ADJUSTABLE.SURROUNDINGS ADDITIONAL.TEACH ADDITIONAL.EQUIPMENT
<u>INTRINSIC.REWARD</u>	Average of:	CHALLENGING.WORK RESPONSIBILITY ADVANCEMENT INVOLVEMENT PROMOTION DIFFICULT.WORK VOLUME.WORK SELF.CONTROL
<u>JOB.CHALLENGE</u>	Average of:	ENJOY.CHALLENGE INDEPENDENT.THUGHT STIMULATING.WORK DIFFICULT.WORK ABILITY.TO.DS.WORK
<u>OVERALL.CLIMATE</u>	Average of:	COMM.EFFECTIVENESS IND.ORG.CONTROL INTERPERSONAL.REL PHYSICAL.ENVIR REWARD.SYS STANDARDS.GOALS
<u>PERSONAL.REL.COMPETENCE</u>	Average of:	SUP.COOPERATIVE SUP.SUPPORTIVE SUP.ENCOURAGING SUP.HELPFUL SUP.FAIR SUP.CONSIDERATE SUP.APPRECIATIVE SUP.ACCEPTANCE

<u>ROLE.CONFLICT</u>	Average of:	<u>CONFUSED.PLANNING</u> <u>UNCLEAR.RESPONS</u> <u>CONFLICT.DEMANDS</u>
<u>SATISFACTION.WITH.GROUP</u>	Average of:	<u>GROUP.PLEASURE</u> <u>ENJOYMENT</u> <u>DESIRE.CHANGE</u> <u>COMPLAINTS</u> <u>DISSATISFACTION</u> <u>MANAGEMENT.CONCERN</u> <u>CARE.OF.PEOPLE</u>
<u>SKILL.VARIETY.HO</u>	Average of:	<u>SKILL.VARIETY</u> <u>REPETITIVE</u> <u>TASK.SIGNIFICANCE</u> <u>BREADTH.SIGNIFICANCE</u> <u>MEANINGFUL.WORK</u> <u>TRIVIAL.WORK</u> <u>TASK.IDENTITY</u>
<u>TASK.COMPETENCE</u>	Average of:	<u>SUP.EFFECTIVE</u> <u>SUP.PRODUCTIVE</u> <u>SUP.EFFICIENT</u> <u>SUP.CONVINCING</u> <u>SUP.LEADER</u> <u>SUP.CONFIDENT</u> <u>SUP.IMAGINATIVE</u> <u>SUP.DECISIVE</u>
<u>TEAMWORK</u>	Average of:	<u>QUARREL</u> <u>TENSION</u> <u>BELONGING</u> <u>UNCOOPERATIVE</u> <u>GET.ALONG</u> <u>CARE.OF.PEOPLE</u>

APPENDIX 13
PERFORMANCE MEASURES AND ELEMENTS

This appendix lists the performance and satisfaction measures used in the expert system. Many different elements are used to express performance in different context. This list includes a mapping of many elements into the limited performance and satisfaction measures. Some general elements like "performance" map into more than one performance measure.

Performance Measures

Mapping Elements

ACHIEVEMENT

Includes: Achievement
Effort
Hard work
Job attitude
Job interest
Motivation
Performance
Productive

EFFECTIVENESS

Includes: Effectiveness
Mental health
Performance
Productive
Responsiveness

EFFICIENCY

Includes: Efficiency
Job interest
Performance
Physical problems

EXCELLENCE

Includes: Commitment
Contribution
Creativity (if needed)
Eminence
Excellence
Innovation (if needed)
Successful

REALIZATION.OF.POTENTIAL

Includes: Creativity (if needed)
Identify with work
Innovation (if needed)
Motivation
Performance
Potential
Successful

Satisfaction MeasuresJOB.SATISFACTION

Includes: Job interest
Meaningfulness of work
Motivation
Physical problems
Quality of life
Satisfaction
Self-esteem
Successful

NEED.FULFILLMENT

Includes: Contribution
Fulfillment
Job attitude
Meaningfulness of work
Mental problems
Morale
Motivated
Pride

SELF.REALIZATION

Includes: Competence
Eminence
Excellence
Growth
Meaningfulness of work
Realize potential
Self-esteem

APPENDIX 14

COMPUTER LISTING OF BEHAVIOR RULES

This appendix lists the LISP computer code representing the behavioral rules. These rules are translated from the behavioral findings in Appendix 1. The rules are written as methods which are activated by messages. The message provides the person to the rule. Specially defined LISP functions GREATER.THAN, LESS.THAN, AVERAGE.OF and LISP constants POSITIVE, NEGATIVE, LOW, HIGH are included in Appendix 18. Other functions GET.VALUE, PUT.VALUE are defined in the expert system development shell.

The form for a frame or unit is:

```
(Unit name
  (Creation and modification data)
  Superclasses list
  Member of list
  Comment
  Member slot list
  Own slot list)
```

The form for a slot is:

```
(Slot name
  Local value or program
  Inheritance role
  Value class
  Default value list
  Facet list or comment)
```

The form for a facet list is:

```
((Facet name
  Facet local value
  Facet role) ...)
```

```

(BEHAVIOR RULES
  ("HOLT" "10-Feb-1987 23:17.51" "HOLT" "21-Apr-1987 11.45 02")
  ((ENTITIES GENERICUNITS))
  ((CLASSES GENERICUNITS))
  "This is the unit holds all the behavioral rules as slots. The rules are trig
  gered by methods "
  ((AUTONOMY CREATIVITY R5
    (LAMBDA (THISUNIT PERSON)
      (PROG (NEW VALUE)
        (COND ((AND (GREATER THAN (GET VALUE PERSON 'IND ORG CONTROL 'VALUE
          'OWN)
                    POSITIVE))
          (GREATER THAN (AVERAGE OF (LIST (GET VALUE PERSON
            'SKILL VARIET
              'VALUE
              'OWN)
              (GET VALUE PERSON
                'INDEPENDENT
                  'VALUE
                  'OWN))))
          (SETQ NEW VALUE (LIST "Autonomy Creativity"
            (GET VALUE PERSON 'IND ORG CONTROL 'VAL
              UE 'OWN))))
          (PUT VALUE PERSON
            'EXCELLENCE
            (CONS NEW VALUE (GET VALUE PERSON 'EXCELLENCE 'VAL
              UE 'OWN))))
          (PUT VALUE PERSON
            'REALIZATION OF POTENTIAL
            (CONS NEW VALUE
              (GET VALUE PERSON
                'REALIZATION OF POTENTIAL
                'VALUE
                'OWN))))
          (T NIL))))))
  METHOD
  (METHOD)
  NIL
  ((COMMENT
    "Where employees have control over work methods (IND ORG CONTROL) and whil
    e there is a need for creativity (SKILL VARIETY, INDEPENDENT THOUGHT) there is in
    creased innovation (EXCELLENCE, REALIZATION OF POTENTIAL) (Patchen 1970) ")))
  (AUTONOMY GROWTH R49
    (LAMBDA (THISUNIT PERSON)
      (PROG (NEW VALUE)
        (COND ((AND (LESS THAN (GET VALUE PERSON 'IND ORG CONTROL 'VALUE 'OW
          N) POSITIVE)
          (LESS THAN (GET VALUE PERSON 'GROWTH DEVELOP 'VALUE 'OWN
            'NEGATIVE)))
          (SETQ NEW VALUE (LIST "Autonomy Growth"
            (AVERAGE OF (LIST (GET VALUE PERSON
              'IND ORG C
                'VALUE
                'OWN)
                (GET VALUE PERSON
                  'GROWTH
                    'VALUE
                    'OWN)))
            (PUT VALUE PERSON
              'NEED FULFILLMENT

```

```

(CONS NEW VALUE
  (GET VALUE PERSON 'NEED FULFILLMENT 'VALUE '
OWN)))

(PUT VALUE PERSON
  'SELF REALIZATION
  (CONS NEW VALUE
    (GET VALUE PERSON 'SELF REALIZATION 'VALUE '
OWN))))

(T NIL))))

METHOD
(METHOD)
NIL
((COMMENT
  "Behavior is dominated by the most basic group of unsatisfied needs. If a
  utonomy is low (IND.ORG.CONTROL) and chances for growth are low (GROWTH DEVELOP)
  then satisfaction will be low (NEED FULFILLMENT, SELF REALIZATION). (Maslow, 197
  0) ")))
(AUTONOMY PRIDE R4
  (LAMBDA (THISUNIT PERSON)
    (PROG (NEW VALUE)
      (COND ((GREATER THAN (GET VALUE PERSON 'IND.ORG.CONTROL 'VALUE 'OWN)
        POSITIVE)
        (SETQ NEW VALUE (LIST "Autonomy Pride"
          (GET VALUE PERSON 'IND.ORG.CONTROL 'VAL
UE 'OWN))))
        (PUT VALUE PERSON
          'ACHIEVEMENT
          (CONS NEW VALUE (GET VALUE PERSON 'ACHIEVEMENT 'VA
LUE 'OWN)))
        (PUT VALUE PERSON
          'EFFICIENCY
          (CONS NEW VALUE (GET VALUE PERSON 'EFFICIENCY 'VAL
UE 'OWN)))
        (PUT VALUE PERSON
          'JOB SATISFACTION
          (CONS NEW VALUE
            (GET VALUE PERSON 'JOB SATISFACTION 'VALUE '
OWN))))
        (PUT VALUE PERSON
          'NEED FULFILLMENT
          (CONS NEW VALUE
            (GET VALUE PERSON 'NEED FULFILLMENT 'VALUE '
OWN))))
      (T NIL))))

METHOD
(METHOD)
NIL
((COMMENT
  "Self control (IND ORG CONTROL) is related to greater job interest (ACHIEV
  EMENT, EFFICIENCY, JOB SATISFACTION) and more pride (NEED FULFILLMENT). (Patchen
  1970) ")))
(AUTONOMY R13
  (LAMBDA
    (THISUNIT PERSON)
    (PROG
      (NEW VALUE)
      (COND ((AND (GREATER THAN (GET VALUE PERSON 'IND ORG CONTROL 'VALUE 'OWN)
        POSITIVE)
        (GREATER THAN (GET VALUE PERSON 'EFFECTIVE PARTICIPATION 'VALU
E 'OWN)
        POSITIVE))
        (SETQ NEW VALUE (LIST "Autonomy"
          (AVERAGE OF (LIST (GET VALUE PERSON
            'IND ORG CONTROL
            'VALUE
            'OWN)
            (GET VALUE PERSON

```

```

CIPATION
EFFECTIVE.PARTI
VALUE
OWN))))
(PUT VALUE PERSON
  JOB.SATISFACTION
  (CONS NEW.VALUE (GET VALUE PERSON 'JOB.SATISFACTION 'VAL
UE 'OWN)))
(PUT VALUE PERSON
  SELF.REALIZATION
  (CONS NEW.VALUE (GET VALUE PERSON 'SELF.REALIZATION 'VAL
UE 'OWN))))
(T NIL))))
METHOD
(METHOD)
NIL
((COMMENT
  "Workers want more autonomy (IND.ORG.CONTROL) and participation in decisio
ns (EFFECTIVE.PARTICIPATION). Work is a crucial psychological role in developmen
t of self-esteem and identity (JOB.SATISFACTION, SELF.REALIZATION). (Upjohn, 197
3) ")))
(AUTONOMY.SATISFACTION.R7
  LAMBDA (THISUNIT PERSON)
    (PROG (NEW.VALUE)
      (SETQ NEW.VALUE (LIST "Autonomy Satisfaction"
        (GET.VALUE PERSON 'IND.ORG.CONTROL 'VALUE 'OWN
)))
    (PUT VALUE PERSON
      JOB.SATISFACTION
      (CONS NEW.VALUE (GET VALUE PERSON 'JOB.SATISFACTION 'VAL
E 'OWN)))
    (PUT VALUE PERSON
      NEED.FULFILLMENT
      (CONS NEW.VALUE (GET VALUE PERSON 'NEED.FULFILLMENT 'VALU
E 'OWN)))
    (PUT VALUE PERSON
      SELF.REALIZATION
      (CONS NEW.VALUE (GET VALUE PERSON 'SELF.REALIZATION 'VALU
E 'OWN))))
METHOD
(METHOD)
NIL
((COMMENT
  "Self control (IND.ORG.CONTROL) is positively related to job satisfaction
(JOB.SATISFACTION, NEED.FULFILLMENT, SELF.REALIZATION) (Bachman and Tannenbaum,
1968) ")))
(CHALLENGE.MANAGEMENT.R35
  LAMBDA (THISUNIT PERSON)
    (PROG (NEW.VALUE)
      (COND ((AND (GREATER.THAN (GET VALUE PERSON 'JOB.CHALLENGE 'VALUE 'O
WN), POSITIVE)
        (GREATER.THAN (GET VALUE PERSON 'LEADER.SUPER 'VALUE 'OW
N), POSITIVE))
        (SETQ NEW.VALUE (LIST "Challenge Management"
          (AVERAGE OF (LIST (GET.VALUE PERSON
            JOB.CHALL
            VALUE
            OWN)
            (GET VALUE PERSON
              LEADER.SU
              VALUE
              OWN))))))
    (PUT VALUE PERSON
      ACHIEVEMENT
      (CONS NEW.VALUE (GET VALUE PERSON 'ACHIEVEMENT '

```

```

LUE 'OWN)))
      (PUT VALUE PERSON
        'SELF-REALIZATION
        (CONS NEW VALUE
          (GET VALUE PERSON 'SELF-REALIZATION 'VALUE '
OWN)))
      (PUT VALUE PERSON
        'JOB-SATISFACTION
        (CONS NEW VALUE
          (GET VALUE PERSON 'JOB-SATISFACTION 'VALUE '
OWN)))
      (T NIL))))
  METHOD
  (METHOD)
  NIL
  ((COMMENT
    "Job challenge (JOB-CHALLENGE) and related management practices (LEADER-SU
PER) are relevant to loyalty (ACHIEVEMENT, NEED-FULFILLMENT). (Bowers, 1973; Bow
ers, Franklin, 1973)."))
    (CHALLENGE-OPPORTUNITY-R36
      (LAMBDA
        (THISUNIT PERSON)
        (PROG (NEW VALUE)
          (COND ((AND (GREATER-THAN (GET VALUE PERSON 'JOB-CHALLENGE 'VALUE 'OW
N) POSITIVE)
                    (GREATER-THAN (GET VALUE PERSON 'GROWTH-DEVELOPMENT-HO 'V
ALUE 'OWN)
                                POSITIVE)))
            (SETQ NEW VALUE (LIST "Challenge Opportunity"
                                  (AVERAGE-OF (LIST (GET VALUE PERSON
'JOB-CHALLE
'VALUE
'OWN)
(GET VALUE PERSON
'GROWTH-DEV
'VALUE
'OWN)))))
            (PUT VALUE PERSON
              'ACHIEVEMENT
              (CONS NEW VALUE (GET VALUE PERSON 'ACHIEVEMENT 'VAL
UE 'OWN)))
            (PUT VALUE PERSON
              'NEED-FULFILLMENT
              (CONS NEW VALUE
                (GET VALUE PERSON 'NEED-FULFILLMENT 'VALUE 'O
WN))))
            (T NIL))))
  METHOD
  (METHOD)
  NIL
  ((COMMENT
    "Challenging work (JOB-CHALLENGE) and opportunity to use valued abilities
(GROWTH-DEVELOPMENT-HO) are found to be important in retention decisions (call it
loyalty) (ACHIEVEMENT, NEED-FULFILLMENT). (Mosbach, Scanlan, 1979)."))
    (CHALLENGE-RESPONSIBILITY-R32
      (LAMBDA (THISUNIT PERSON)
        (COND ((AND (GREATER-THAN (GET VALUE PERSON 'JOB-CHALLENGE 'VALUE 'OWN) PC
SITIVE,
                    (GREATER-THAN (GET VALUE PERSON 'IND-ORG-CONTROL 'VALUE 'OWN)
                                POSITIVE)))
            (PUT VALUE PERSON
              'ACHIEVEMENT
              (LIST "Challenge Responsibility"
                (CONS (AVERAGE-OF (LIST (GET VALUE PERSON
'JOB-CHALLENGE

```

```

'VALUE
'OWN)
(GET VALUE PERSON
'IND.ORG.CONTRO

L
'VALUE
'OWN)))
(GET.VALUE PERSON 'ACHIEVEMENT 'VALUE 'OWN))
)))
(T NIL)))
METHOD
(METHOD)
NIL
((COMMENT
"Challenging work (JOB.CHALLENGE) should be coupled with liberal responsib
lity (IND.ORG.CONTROL) for best performance (ACHIEVEMENT). (Schultz, 1970)."))
(CHALLENGE.SATISFACTION R34
(LAMBDA (THISUNIT PERSON)
(PROG (NEW.VALUE)
(COND ((GREATER.THAN (GET.VALUE PERSON 'JOB.CHALLENGE 'VALUE 'OWN) P
OSITIVE)
(SETQ NEW.VALUE (LIST "Challenge Satisfaction"
(GET.VALUE PERSON 'JOB.CHALLENGE 'VALUE
'OWN))))
(PUT.VALUE PERSON
'NEED.FULFILLMENT
(CONS NEW.VALUE
(GET.VALUE PERSON 'NEED.FULFILLMENT 'VALUE '
OWN)))
(PUT.VALUE PERSON
'SELF.REALIZATION
(CONS NEW.VALUE
(GET.VALUE PERSON 'SELF.REALIZATION 'VALUE '
OWN)))
(PUT.VALUE PERSON
'JOB.SATISFACTION
(CONS NEW.VALUE
(GET.VALUE PERSON 'JOB.SATISFACTION 'VALUE '
OWN))))
(T NIL))))
METHOD
(METHOD)
NIL
((COMMENT
"Job challenge (JOB.CHALLENGE) is a primary determinant of job satisfactio
n (NNEED.FULFILLMENT, SELF.REALIZATION, JOB.SATISFACTION) (Walsh, Taber, Beehr,
1980, Schneider, Hall 1972)."))
(COHESIVE.ACCEPT.R25
(LAMBDA (THISUNIT PERSON)
(PROG (NEW.VALUE)
(COND ((AND (GREATER.THAN (GET.VALUE PERSON 'COHESIVE 'VALUE 'OWN) P
OSITIVE)
(GREATER.THAN (GET.VALUE PERSON 'STANDARDS.GOALS 'VALUE
'OWN)
POSITIVE))
(SETQ NEW.VALUE (LIST "Cohesive Accept"
(AVERAGE OF (LIST (GET.VALUE PERSON
'COHESIVE
'VALUE
'OWN)
(GET.VALUE PERSON
'STANDARDS
'VALUE
'OWN))))))
(PUT.VALUE PERSON
'ACHIEVEMENT

```

```

                                (CONS NEW.VALUE (GET VALUE PERSON 'ACHIEVEMENT 'VA
LUE 'OWN)))
                                (PUT.VALUE PERSON
                                'EFFECTIVENESS
                                (CONS NEW.VALUE (GET.VALUE PERSON 'EFFECTIVENESS '
VALUE 'OWN)))
                                (PUT.VALUE PERSON
                                'EFFICIENCY
                                (CONS NEW.VALUE (GET.VALUE PERSON 'EFFICIENCY 'VAL
UE 'OWN)))
                                (PUT.VALUE PERSON
                                'REALIZATION.OF.POTENTIAL
                                (CONS NEW.VALUE
                                (GET.VALUE PERSON
                                'REALIZATION.OF.POTENTIAL
                                'VALUE
                                'OWN))))
                                (T NIL)))

METHOD
(METHOD)
NIL
((COMMENT
  "Highly cohesive groups (COHESIVE) are above average in performance (ACHIE
VEMENT, EFFECTIVENESS, EFFICIENCY, REALIZATION.OF.POTENTIAL) when the group accep
ts the organizations goals (STANDARDS.GOALS) (Seashore, 1954)."))
(COHESIVE.GOALS.R23
 (LAMBDA
  (THISUNIT PERSON)
  (PROG
   NIL
   (COND ((AND (GREATER.THAN (GET.VALUE PERSON 'EFFECTIVE PARTICIPATION 'VALU
E 'OWN)
                                POSITIVE)
              (GREATER.THAN (GET.VALUE PERSON 'STANDARDS.GOALS 'VALUE 'OWN)
              (GREATER.THAN (GET.VALUE PERSON 'COMM.EFFECTIVENESS 'VALUE 'OWN)
              (GREATER.THAN (GET.VALUE PERSON 'REWARD.SYS 'VALUE 'OWN) POSIT
IVE)
              (LESS.THAN (GET.VALUE PERSON 'LACK.OF.INFLUENCE 'VALUE 'OWN) P
OSITIVE)
              (AND (LESS.THAN (GET.VALUE PERSON 'STRESS 'VALUE 'OWN) HIGH)
                    (GREATER.THAN (GET.VALUE PERSON 'STRESS 'VALUE 'OWN) LOW)
              ))
   (PUT.VALUE PERSON
    'COHESIVE
    (LIST "Cohesive Goals"
          (CONS (AVERAGE OF (LIST (GET VALUE PERSON
                                'EFFECTIVE PART
                                'VALUE
                                'OWN)
                                (GET VALUE PERSON
                                'STANDARDS GOAL
                                'VALUE
                                'OWN)
                                (GET VALUE PERSON
                                'COMM.EFFECTIVE
                                'VALUE
                                'OWN)
                                (GET VALUE PERSON
                                'REWARD.SYS
                                'VALUE
                                'OWN)
                                (- (GET VALUE PERSON

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                                'STRESS
                                'VALUE
                                'OWN))))
                                (GET.VALUE PERSON 'COHESIVE 'VALUE 'OWN))))))
                                (T NIL))))
METHOD
(METHOD)
NIL
((COMMENT
  "Cohesive groups (COHESIVE) generally demonstrate universal participation
  (EFFECTIVE.PARTICIPATION), have clear understandable objectives (STANDARDS GOALS)
  , have frank open communications (COMM.EFFECTIVENESS), have integrated values and
  needs (REWARD.SYS), share mutual influence (LACK.OF.INFLUENCE) and are willing
  to deal with conflict (STRESS). (Likert, 1961, McGregor, 1960)."))
  (COHESIVE.IDENTIFY.R24
    (LAMBDA (THISUNIT PERSON)
      (PROG NIL
        (COND ((GREATER.THAN (GET.VALUE PERSON 'COHESIVE 'VALUE 'OWN) POSITI
VE)
          (PUT.VALUE PERSON
            'REALIZATION.OF.POTENTIAL
            (LIST "Cohesive Identify"
              (GET.VALUE PERSON 'COHESIVE 'VALUE 'OWN))))
          (T NIL))))))
METHOD
(METHOD)
NIL
((COMMENT
  "Cohesiveness (COHESIVE) is linked to identification with the work organiz
  ation (REALIZATION.OF.POTENTIAL). (Patchen, 1970) ")
  (COHESIVE.NON.ACCEPT.R26
    (LAMBDA (THISUNIT PERSON)
      (PROG (NEW.VALUE)
        (COND ((AND (GREATER.THAN (GET.VALUE PERSON 'COHESIVE 'VALUE 'OWN) P
OSITIVE)
          (LESS.THAN (GET.VALUE PERSON 'STANDARDS GOALS 'VALUE 'OW
N) NEGATIVE))
          (SETQ NEW.VALUE (LIST "Cohesive Non Acceptance"
            (AVERAGE.OF (LIST (- (GET.VALUE PERSON
              'COHESI
                                'VALUE
                                'OWN))
              (GET.VALUE PERSON
                'STANDARDS
                                'VALUE
                                'OWN))))))
          (PUT.VALUE PERSON
            'ACHIEVEMENT
            (CONS NEW.VALUE (GET.VALUE PERSON 'ACHIEVEMENT 'VA
LUE 'OWN))))
          (PUT.VALUE PERSON
            'EFFECTIVENESS
            (CONS NEW.VALUE (GET.VALUE PERSON 'EFFECTIVENESS '
VALUE 'OWN))))
          (PUT.VALUE PERSON
            'EFFICIENCY
            (CONS NEW.VALUE (GET.VALUE PERSON 'EFFICIENCY 'VAL
UE 'OWN))))
          (PUT.VALUE PERSON
            'REALIZATION.OF.POTENTIAL
            (CONS NEW.VALUE
              (GET.VALUE PERSON
                'REALIZATION.OF.POTENTIAL
                'VALUE
                'OWN))))))

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                                (T NIL))))
METHOD
(METHOD)
NIL
((COMMENT
  "Highly cohesive groups (COHESIVE) perform below average (ACHIEVEMENT, EFF
  ECTIVENESS, EFFICIENCY, REALIZATION OF POTENTIAL) if the group does not accept th
  e organizational goals (STANDARDS.GOALS). (Seashore, 1954)."))
(COHESIVE.PRODUCTIVE.R27
  (LAMBDA (THISUNIT PERSON)
    (PROG (NEW.VALUE)
      (COND ((GREATER.THAN (GET.VALUE PERSON 'COHESIVE 'VALUE 'OWN) POSITI
VE)
        (SETQ NEW.VALUE (LIST "Cohesive Productive"
                              (GET.VALUE PERSON 'COHESIVE 'VALUE 'OWN
)))
        (PUT.VALUE PERSON
          'ACHIEVEMENT
          (CONS NEW.VALUE (GET.VALUE PERSON 'ACHIEVEMENT 'VA
LUE 'OWN)))
        (PUT.VALUE PERSON
          'EFFECTIVENESS
          (CONS NEW.VALUE (GET.VALUE PERSON 'EFFECTIVENESS '
VALUE 'OWN))))
      (T NIL))))
METHOD
(METHOD)
NIL
((COMMENT
  "Cohesive groups (COHESIVE) are typically more productive (ACHIEVEMENT, EF
  FECTIVENESS). (MILLS, 1967)."))
(COMM.EFFECTIVENESS.R37
  (LAMBDA (THISUNIT PERSON)
    (COND ((GREATER.THAN (GET.VALUE PERSON 'COMM.EFFECTIVENESS 'VALUE 'OWN) PO
SITIVE)
      (PUT.VALUE PERSON
        'EFFICIENCY
        (LIST "Comm Effectiveness"
              (CONS (GET.VALUE PERSON 'COMM.EFFECTIVENESS 'VALUE
'OWN)
                    (GET.VALUE PERSON 'EFFICIENCY 'VALUE 'OWN))))
      (T NIL))))
METHOD
(METHOD)
NIL
((COMMENT
  "The communications system (COMM EFFECTIVENESS) ties together efficiency a
nd resource use (EFFICIENCY) (Berlo in Farace and MacDonald, 1974)."))
(COMMITMENT.COMM.R22
  (LAMBDA (THISUNIT PERSON)
    (PROG NIL
      (COND ((AND (GREATER.THAN (GET.VALUE PERSON 'STANDARDS.GOALS 'VALUE
'OWN)
        POSITIVE)
        (GREATER.THAN (GET.VALUE PERSON 'COMM.EFFECTIVENESS 'VAL
UE 'OWN)
        POSITIVE)
        (GREATER.THAN (GET.VALUE PERSON 'INTERPERSONAL.REL 'VALU
E 'OWN)
        POSITIVE))
      (PUT.VALUE PERSON
        'COHESIVE
        (LIST "Commitment Comm"
              (CONS (AVERAGE OF (LIST (GET.VALUE PERSON
STANDARDS

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'VALUE
'OWN)
(GET VALUE PERSON
'COMM.EFF

ECTIVENESS

'VALUE
'OWN)
(GET VALUE PERSON
'INTERPER

SONAL.REL

'VALUE
'OWN)))
(GET VALUE PERSON 'COHESIVE 'VALUE 'OW

N))))
(T NIL))))

METHOD
(METHOD)
NIL
((COMMENT
  "Groups with greater commitment to goals (STANDARDS.GOALS), more open comm
  unication (COMM EFFECTIVENESS) and more friendly interpersonal relations (INTERPE
  RSONAL.REL) manifest cohesiveness (COHESIVE). (Secrist, 1981).")
  (DISTRUST.R10
    (LAMBDA
      (THISUNIT PERSON)
      (PROG
        NIL
        (COND
          ((AND (LESS.THAN (GET VALUE PERSON 'TRUST 'VALUE 'OWN) NEGATIVE)
            (GREATER.THAN (GET VALUE PERSON 'EFFECTIVE.PARTICIPATION 'VALUE 'OW
N) POSITIVE))
            (PUT VALUE PERSON
              'SELF.REALIZATION
              (LIST "Distrust"
                (CONS (AVERAGE.OF (LIST (GET VALUE PERSON 'TRUST 'VALUE
'OWN)
              (- (GET VALUE PERSON
                'EFFECTIVE PARTIC
IPATION
'VALUE
'OWN))))
              (GET VALUE PERSON 'SELF REALIZATION 'VALUE 'OWN))
            ))
            (T NIL))))
      METHOD
      (METHOD)
      NIL
      ((COMMENT
        "In a highly participative environment (EFFECTIVE PARTICIPATION), if there
        is distrust (TRUST), it destroys concerted actions (SELF REALIZATION) (Rosenfel
        d and Smith, 1967).")
        (EXTERNAL.CONTROL R11
          (LAMBDA (THISUNIT PERSON)
            (PROG (NEW VALUE)
              (COND ((LESS.THAN (GET VALUE PERSON 'IND ORG CONTROL 'VALUE 'OWN) PO
SITIVE)
                (SETO NEW VALUE (LIST "External Control"
                  (GET VALUE PERSON 'IND ORG CONTROL 'VAL
UE 'OWN)))
                (PUT VALUE PERSON
                  'ACHIEVEMENT
                  (CONS NEW VALUE (GET VALUE PERSON 'ACHIEVEMENT 'VA
LUE 'OWN)))
                (PUT VALUE PERSON
                  'EFFICIENCY
                  (CONS NEW VALUE (GET VALUE PERSON 'EFFICIENCY 'VAL
UE 'OWN)))

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(PUT VALUE PERSON
  'JOB SATISFACTION
  (CONS NEW VALUE
    (GET VALUE PERSON 'JOB SATISFACTION 'VALUE '
OWN)))

(PUT VALUE PERSON
  'NEED FULFILLMENT
  (CONS NEW VALUE
    (GET VALUE PERSON 'NEED FULFILLMENT 'VALUE '
OWN)))

(PUT VALUE PERSON
  'ACHIEVEMENT
  (CONS NEW VALUE (GET VALUE PERSON 'ACHIEVEMENT 'VA
LUE 'OWN))))

(T NIL)))

METHOD
(METHOD)
NIL
((COMMENT
  "External control (IND.ORG.CONTROL) is less effective because it contribut
es to psychological withdrawal (call it job interest) (ACHIEVEMENT, EFFICIENCY, JO
B SATISFACTION) and diminishes willingness to contribute (call it job attitude) (
NEED FULFILLMENT, ACHIEVEMENT). (Argyris, 1972)."))
(FULFILLMENT.GROWTH.R46
  (LAMBDA (THISUNIT PERSON)
    (COND ((AND (GREATER THAN (GET VALUE PERSON 'IND.ORG.CONTROL 'VALUE 'OWN)
POSITIVE)
      (GREATER THAN (GET VALUE PERSON 'GROWTH.DEVELOPMENT 'VALUE 'OW
N) POSITIVE))
      (PUT VALUE PERSON
        'NEED FULFILLMENT
        (LISP "FULFILLMENT Growth"
          (CONS (AVERAGE OF (LIST (GET VALUE PERSON
REWARDS
      'IMPORTANCE OF
        'VALUE
        'OWN)
        (GET VALUE PERSON
          'REWARD SYS
          'VALUE
          'OWN))),
        (GET VALUE PERSON 'NEED FULFILLMENT 'VALUE '
OWN))))))

(T NIL)))

METHOD
(METHOD)
NIL
((COMMENT
  "Higher order need gratification (NEED FULFILLMENT) is related to the auto
nomy of the job (IND.ORG.CONTROL) and the growth experiences of the job (GROWTH D
EVELOPMENT HO). (Lawler, Hall, 1970)."))
(INTEREST SUPERVISOR.R44
  (LAMBDA (THISUNIT PERSON)
    (PROG (NEW VALUE)
      (COND ((AND (GREATER THAN (GET VALUE PERSON 'SKILL VARIETY HO 'VALUE
'OWN)
        POSITIVE)
        (GREATER THAN (GET VALUE PERSON 'JOB CHALLENGE 'VALUE 'O
WN, POSITIVE)
        (GREATER THAN (GET VALUE PERSON 'LEADER SUPER 'VALUE 'OW
N) POSITIVE))
        (SETQ NEW VALUE (LIST "Interest Supervisor"
          (AVERAGE OF (LIST (GET VALUE PERSON
      'SKILL VAR
        'VALUE
        'OWN)

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                                (GET VALUE PERSON
                                'JOB CHALL
                                'VALUE
                                'OWN)
                                (GET VALUE PERSON
                                'LEADER.SU
                                'VALUE
                                'OWN))))
ENGINE
                                (PUT VALUE PERSON
                                'JOB.SATISFACTION
                                (CONS NEW.VALUE
                                (GET VALUE PERSON 'JOB.SATISFACTION 'VALUE '
OWN)))
                                (PUT VALUE PERSON
                                'EFFICIENCY
                                (CONS NEW.VALUE (GET VALUE PERSON 'EFFICIENCY 'VAL
UE 'OWN))))
                                (T NIL))))
METHOD
(METHOD)
NIL
((COMMENT
  "Interesting work (SKILL.VARIETY.HO, JOB.CHALLENGE) and a good supervisor
  (LEADER.SUPER) produce job satisfaction (JOB.SATISFACTION) and efforts at efficie
ncy (EFFICIENCY)."))
  (INTERPERSONAL.REL.R12
    (LAMBDA (THISUNIT PERSON)
      (PROG (NEW.VALUE)
        (COND ((GREATER.THAN (GET VALUE PERSON 'INTERPERSONAL.REL 'VALUE 'OW
N) POSITIVE)
          (SETQ NEW.VALUE (LIST "Interpersonal Relations"
                                (GET VALUE PERSON 'INTERPERSONAL.REL 'V
ALUE 'OWN)))
          (PUT VALUE PERSON
            'ACHIEVEMENT
            (CONS NEW.VALUE (GET VALUE PERSON 'ACHIEVEMENT 'VA
LUE 'OWN)))
          (PUT VALUE PERSON
            'REALIZATION.OF.POTENTIAL
            (CONS NEW.VALUE
              (GET VALUE PERSON 'REALIZATION.OF.POTENTIAL
'VALUE 'OWN)))
          (PUT VALUE PERSON
            'JOB.SATISFACTION
            (CONS NEW.VALUE
              (GET VALUE PERSON 'JOB.SATISFACTION 'VALUE '
OWN)))
          (PUT VALUE PERSON
            'NEED.FULLFILLMENT
            (CONS NEW.VALUE
              (GET VALUE PERSON 'NEED.FULLFILLMENT 'VALUE '
OWN))))
          (T NIL))))
METHOD
(METHOD)
NIL
((COMMENT
  "Participation in across work groups and within work groups decision makin
g (INTERPERSONAL.REL) results in increased involvement and commitment (ACHIEVEMEN
T REALIZATION.OF.POTENTIAL, JOB.SATISFACTION, NEED.FULLFILLMENT) Drake and Mitc
hell, 1976)"))
  (INVOLVEMENT.R52
    (LAMBDA (THISUNIT PERSON)
      (PROG (NEW.VALUE)
        (COND ((AND (GREATER.THAN (GET VALUE PERSON 'INVOLVEMENT 'VALUE 'OWN

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) POSITIVE)
      (GREATER THAN (GET VALUE PERSON 'NEED FOR INVOLVEMENT 'V
      ALUE 'OWN)
      POSITIVE))
      (SETQ NEW VALUE (LIST "Involvement"
      (GET VALUE PERSON 'PHYSICAL ENVIR 'VALU
      E 'OWN)))
      (PUT VALUE PERSON
      'JOB SATISFACTION
      (CONS NEW VALUE
      (GET VALUE PERSON 'JOB SATISFACTION 'VALUE '
      OWN)))
      (PUT VALUE PERSON
      'NEED FULFILLMENT
      (CONS NEW VALUE
      (GET VALUE PERSON 'NEED FULFILLMENT 'VALUE '
      OWN)))
      (T NIL))))
      METHOD
      (METHOD)
      NIL
      ((COMMENT
      "Job involvement (INVOLVEMENT, NEED FOR INVOLVEMENT) is a potent moderator
      of organizational environment (PHYSICAL ENVIR) and individual satisfaction (JOB
      SATISFACTION, NEED FULFILLMENT). (Battis, 1978)."))
      (LACK OF STRESS R21
      (LAMBDA (THISUNIT PERSON)
      (PROG (NEW VALUE)
      (COND ((LESS THAN (GET VALUE PERSON 'STRESS 'VALUE 'OWN) LOW)
      (SETQ NEW VALUE (LIST "Lack of Stress"
      (GET VALUE PERSON 'STRESS 'VALUE 'OWN))
      )
      (PUT VALUE PERSON
      'ACHIEVEMENT
      (CONS NEW VALUE (GET VALUE PERSON 'ACHIEVEMENT 'VA
      LUE 'OWN)))
      (PUT VALUE PERSON
      'EFFICIENCY
      (CONS NEW VALUE (GET VALUE PERSON 'EFFICIENCY 'VAL
      UE 'OWN)))
      (PUT VALUE PERSON
      'EFFECTIVENESS
      (CONS NEW VALUE (GET VALUE PERSON 'EFFECTIVENESS '
      VALUE 'OWN)))
      (PUT VALUE PERSON
      'REALIZATION OF POTENTIAL
      (CONS NEW VALUE
      (GET VALUE PERSON
      'REALIZATION OF POTENTIAL
      'VALUE
      'OWN))))
      (T NIL))))
      METHOD
      (METHOD)
      NIL
      ((COMMENT
      "Lack of any job stress (STRESS) at all may cause a negative deviation fro
      m nominal functioning (ACHIEVEMENT, EFFICIENCY, EFFECTIVENESS, REALIZATION OF POT
      ENTIAL). (Beehr, Newman, 1978, Schuler, 1980, Wherry and Curran, 1966)."))
      (LEADER CLIMATE R20
      (LAMBDA (THISUNIT PERSON)
      (PROG (NEW VALUE)
      (COND ((AND (LESS THAN (GET VALUE PERSON 'LEADER SUPER 'VALUE 'OWN)
      NEGATIVE)
      (LESS THAN (GET VALUE PERSON 'OVERALL CLIMATE 'VALUE 'LOW
      N) NEGATIVE))
      (SETQ NEW VALUE (LIST "Leader Climate"

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                                (AVERAGE OF (LIST (GET VALUE PERSON
PER                                'LEADER.SU
                                'VALUE
                                'OWN)
                                (GET VALUE PERSON
LIMATE                                'OVERALL.C
                                'VALUE
                                'OWN))))))
                                (PUT VALUE PERSON
                                'JOB.SATISFACTION
                                (CONS NEW VALUE
                                (GET VALUE PERSON 'JOB.SATISFACTION 'VALUE '
OWN))))
                                (PUT VALUE PERSON
                                'EFFICIENCY
                                (CONS NEW VALUE (GET VALUE PERSON 'EFFICIENCY 'VAL
UE 'OWN))))
                                (PUT VALUE PERSON
                                'EFFECTIVENESS
                                (CONS NEW VALUE (GET VALUE PERSON 'EFFECTIVENESS '
VALUE 'OWN))))
                                (PUT VALUE PERSON
                                'REALIZATION OF POTENTIAL
                                (CONS NEW VALUE
                                (GET VALUE PERSON
                                'REALIZATION OF POTENTIAL
                                'VALUE
                                'OWN))))
                                (T NIL))))
METHOD
(METHOD)
NIL
((COMMENT
  "Leader behavior (LEADER.SUPER) and organizational climate (OVERALL CLIMAT
E) contribute to increased accidents and injury (EFFICIENCY, EFFECTIVENESS, JOB.S
ATISFACTION, REALIZATION OF POTENTIAL). (Butler and Jones, 1979).")
(MEANINGFUL WORK RS0
(LAMBDA (THISUNIT PERSON)
  (PROG (NEW VALUE)
    (COND ((AND (GREATER THAN (AVERAGE OF (LIST (GET VALUE PERSON
Y HO                                'SKILL.VARIET
                                'VALUE
                                'OWN)
                                (GET VALUE PERSON
Y                                'TASK IDENTIT
                                'VALUE
                                'OWN)
                                (GET VALUE PERSON
ITY                                'TASK CONTINU
                                'VALUE
                                'OWN)
                                (GET VALUE PERSON
DANCE                                'TASK SIGNIFI
                                'VALUE
                                'OWN))))
                                POSITIVE)
                                (GREATER THAN (GET VALUE PERSON 'IND ORG CONTROL 'VALUE
OWN)                                POSITIVE)
                                (GREATER THAN (GET VALUE PERSON 'REWARD SYS 'VALUE 'OWN)
POSITIVE)))

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      (SETQ NEW-VALUE (LIST "Meaningful Work"
                            (AVERAGE OF (LIST (GET-VALUE PERSON
                                                'MEANINGFUL
L WORK
                                                'VALUE
                                                'OWN)
                                                (GET-VALUE PERSON
ONTROL
                                                'IND-ORG-CONTROL
                                                'VALUE
                                                'OWN)
                                                (GET-VALUE PERSON
S
                                                'REWARD-SYSTEM
                                                'VALUE
                                                'OWN))))))
      (PUT-VALUE PERSON
        'JOB-SATISFACTION
        (CONS NEW-VALUE
              (GET-VALUE PERSON 'JOB-SATISFACTION 'VALUE '
OWN))))
      (PUT-VALUE PERSON
        'NEED-FULFILLMENT
        (CONS NEW-VALUE
              (GET-VALUE PERSON 'NEED-FULFILLMENT 'VALUE '
OWN))))
      (PUT-VALUE PERSON
        'ACHIEVEMENT
        (CONS NEW-VALUE (GET-VALUE PERSON 'ACHIEVEMENT 'VA
LUE 'OWN))))
      (PUT-VALUE PERSON
        'EFFECTIVENESS
        (CONS NEW-VALUE (GET-VALUE PERSON 'EFFECTIVENESS '
VALUE 'OWN))))
      (PUT-VALUE PERSON
        'EFFICIENCY
        (CONS NEW-VALUE (GET-VALUE PERSON 'EFFICIENCY 'VAL
UE 'OWN))))
      (PUT-VALUE PERSON
        'REALIZATION-OF-POTENTIAL
        (CONS NEW-VALUE
              (GET-VALUE PERSON
                'REALIZATION-OF-POTENTIAL
                'VALUE
                'OWN))))
      (T-NIL))))
METHOD
(METHOD)
NIL
((COMMENT
  "If work is meaningful (SKILL-VARIETY HO, TASK-IDENTITY, TASK-CONTINUITY,
  TASK-SIGNIFICANCE) in an autonomous environment (IND-ORG-CONTROL) and offering ap
  propriate rewards (REWARD-SYS) then workers will be highly motivated (JOB-SATISFA
  CTION, NEED-FULFILLMENT, ACHIEVEMENT, EFFECTIVENESS, EFFICIENCY, REALIZATION OF P
  OTENTIAL) (Hackman, Oldham 1975, 1976) ""))
(MOTIVATION-SKILL-USE-R9
  (LAMBDA (THIS-UNIT PERSON)
    (PUT-VALUE PERSON
      'JOB-MOTIVATION
      (LIST "Motivation Skill Use"
            (CONS (AVERAGE OF (LIST (GET-VALUE PERSON
                                      'SKILL-VARIETY-HO
                                      'VALUE
                                      'OWN)
                                      (GET-VALUE PERSON
IND-ORG-CONTROL
                                      'VALUE

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                                'OWN)
                                (GET.VALUE PERSON 'REWARD SYS 'VA
LUE 'OWN)))
                                (GET.VALUE PERSON 'JOB.MOTIVATION 'VALUE 'OWN))))
    METHOD
    (METHOD)
    NIL
    ((COMMENT
      "Job motivation (JOB.MOTIVATION) is porportional to use of skills (SKILL.V
      ARIETY), individual control of work (IND ORG.CONTROL) and feedback (REWARD.SYS).
      (Hackman and Oldham, 1980)")))
      (OVERALL CLIMATE R17
      (LAMBDA (THISUNIT PERSON)
      (PROG NIL
      (COND ((GREATER.THAN (GET.VALUE PERSON 'OVERALL CLIMATE 'VALUE 'OWN)
      POSITIVE)
        (PUT.VALUE PERSON
          'NEED.FULFILLMENT
          (LIST "Overall Climate"
            (CONS (GET.VALUE PERSON 'OVERALL CLIMATE 'VA
LUE 'OWN))))
          (GET.VALUE PERSON 'NEED.FULFILLMENT 'V
ALUE 'OWN))))))
      (T NIL))))
    METHOD
    (METHOD)
    NIL
    ((COMMENT
      "The job setting and organizational environment (OVERALL CLIMATE) is a pr
      mary source of need satisfaction (NEED.FULFILLMENT). (Secrist, 1981)."))
      (PARTICIPATION.INVOLVEMENT.R8
      (LAMBDA (THISUNIT PERSON)
      (PROG (NEW.VALUE)
      (SETQ NEW.VALUE (LIST "Participation Involvement"
      (GET.VALUE PERSON 'EFFECTIVE PARTICIPATION 'VA
LUE 'OWN)))
      (PUT.VALUE PERSON
        'JOB.SATISFACTION
        (CONS NEW.VALUE (GET.VALUE PERSON 'JOB.SATISFACTION 'VALU
E 'OWN)))
      (PUT.VALUE PERSON
        'NEED.FULFILLMENT
        (CONS NEW.VALUE (GET.VALUE PERSON 'NEED.FULFILLMENT 'VALU
E 'OWN)))
      (PUT.VALUE PERSON
        'SELF.REALIZATION
        (CONS NEW.VALUE (GET.VALUE PERSON 'SELF.REALIZATION 'VALU
E 'OWN))))))
    METHOD
    (METHOD)
    NIL
    ((COMMENT
      "Participative management can be effective to instill a sense of involveme
      nt (JOB.SATISFACTION) and meet higher order needs (NEED.FULFILLMENT, SELF.REALIZA
      TION). (Rosenfeld and Smith, 1967)."))
      (PARTICIPATION.R6
      (LAMBDA (THISUNIT PERSON)
      (PROG (NEW.VALUE)
      (COND ((GREATER.THAN (GET.VALUE PERSON 'EFFECTIVE PARTICIPATION 'VAL
      UE 'OWN)
      POSITIVE)
        (SETQ NEW.VALUE (LIST "Participation
          (GET.VALUE PERSON
            'EFFECTIVE PARTICIPATION
            'VALUE
            'OWN))
        (PUT.VALUE PERSON

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                                'ACHIEVEMENT
                                (CONS NEW VALUE (GET VALUE PERSON 'ACHIEVEMENT 'VA
LUE 'OWN)))
                                (PUT VALUE PERSON
                                'NEED.FULFILLMENT
                                (CONS NEW VALUE
                                (GET.VALUE PERSON 'NEED FULFILLMENT 'VALUE '
OWN)))
                                (PUT.VALUE PERSON
                                'ACHIEVEMENT
                                (CONS NEW VALUE (GET VALUE PERSON 'ACHIEVEMENT 'VA
LUE 'OWN)))
                                (PUT.VALUE PERSON
                                'EFFECTIVENESS
                                (CONS NEW VALUE (GET.VALUE PERSON 'EFFECTIVENESS '
VALUE 'OWN)))
                                (PUT.VALUE PERSON
                                'EFFICIENCY
                                (CONS NEW VALUE (GET.VALUE PERSON 'EFFICIENCY 'VAL
UE 'OWN)))
                                (PUT.VALUE PERSON
                                'REALIZATION.OF.POTENTIAL
                                (CONS NEW VALUE
                                (GET.VALUE PERSON
                                'REALIZATION OF POTENTIAL
                                'VALUE
                                'OWN))))
                                (T NIL))))
METHOD
(METHOD)
NIL
((COMMENT
  "Employee participation (EFFECTIVE.PARTICIPATION) improved job attitudes (
ACHIEVEMENT, NEED FULFILLMENT) and performance (ACHIEVEMENT, EFFECTIVENESS, EFFIC
IENCY, REALIZATION.OF.POTENTIAL). (Chaney, 1969; Schefflen, Lawler and Hackman, 1
971, Vroom, 1963).")
  (REWARD.IMPORTANCE.R45
  (LAMBDA (THISUNIT PERSON)
    (PROG (NEW VALUE)
      (COND ((AND (GREATER.THAN (GET.VALUE PERSON 'IMPORTANCE OF REWARDS '
VALUE 'OWN)
                                POSITIVE)
              (GREATER.THAN (GET.VALUE PERSON 'REWARD SYS 'VALUE 'OWN)
                              POSITIVE))
        (SETQ NEW VALUE (LIST "Reward Importance"
                              (AVERAGE.OF (LIST (GET VALUE PERSON
                                                    'IMPORTANC
                                                    'VALUE
                                                    'OWN)
                                                  (GET.VALUE PERSON
                                                    'REWARD SY
                                                    'VALUE
                                                    'OWN))))))
      (PUT VALUE PERSON
        'ACHIEVEMENT
        (CONS NEW VALUE (GET VALUE PERSON 'ACHIEVEMENT 'VA
LUE 'OWN)))
      (PUT VALUE PERSON
        'EFFECTIVENESS
        (CONS NEW VALUE (GET VALUE PERSON 'EFFECTIVENESS '
VALUE 'OWN)))
      (PUT VALUE PERSON
        'EFFICIENCY
        (CONS NEW VALUE (GET VALUE PERSON 'EFFICIENCY 'VAL
UE 'OWN)))

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(PUT VALUE PERSON
  'REALIZATION OF POTENTIAL
  (CONS NEW VALUE
    (GET VALUE PERSON
      'REALIZATION OF POTENTIAL
      'VALUE
      'OWN))))
(T NIL)))

METHOD
(METHOD)
NIL
((COMMENT
  "There is a strong link between reward importance (IMPORTANCE OF REWARD) w
  ith job feedback (REWARD SYS) and job performance (ACHIEVEMENT, EFFECTIVENESS, EF
  FICIENCY, REALIZATION OF POTENTIAL). (Lawler, 1967) ")
  (REWARD NEEDS R43
    (LAMBDA
      (THISUNIT PERSON)
      (PROG (NEW VALUE)
        (COND ((AND (GREATER THAN (GET VALUE PERSON 'EXPECTATION OF REWARDS '
        VALUE 'OWN)
          POSITIVE)
          (GREATER THAN (GET VALUE PERSON 'IMPORTANCE OF REWARDS 'V
        ALUE 'OWN)
          POSITIVE))
        (SETQ NEW VALUE (LIST "Rewards Needs"
          (AVERAGE OF (LIST (GET VALUE PERSON
            'EXPECTATIO
            'VALUE
            'OWN)
            (GET VALUE PERSON
              'IMPORTANCE
              'VALUE
              'OWN))))))
        (PUT VALUE PERSON
          'ACHIEVEMENT
          (CONS NEW VALUE (GET VALUE PERSON 'ACHIEVEMENT 'VAL
        UE 'OWN))))
        (PUT VALUE PERSON
          'REALIZATION OF POTENTIAL
          (CONS NEW VALUE (GET VALUE PERSON 'ACHIEVEMENT 'VAL
        UE 'OWN))))
        (PUT VALUE PERSON
          'JOB SATISFACTION
          (CONS NEW VALUE
            (GET VALUE PERSON 'JOB SATISFACTION 'VALUE 'O
          WN)))
        (PUT VALUE PERSON
          'NEED FULFILLMENT
          (CONS NEW VALUE
            (GET VALUE PERSON 'NEED FULFILLMENT 'VALUE 'O
          WN))))
        (T NIL)))
      METHOD
      (METHOD)
      NIL
      ((COMMENT
        "The equity theory says people attempt to balance input effort with the re
        wards they receive. High expectations (EXPECTATION OF REWARD) and high importa
        nce of receiving rewards (IMPORTANCE OF REWARDS) prompts higher work effort (ACHI
        EVEMENT, REALIZATION OF POTENTIAL, JOB SATISFACTION, NEED FULFILLMENT). (Adams,
        1965, Mitchell, 1969, Porter, Lawler, 1968) ")
        (REWARD ROLE CLARITY R42
          (LAMBDA (THISUNIT PERSON)
            (PROG (NEW VALUE)

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(COND ((GREATER THAN (GET VALUE PERSON 'ROLE.CONFLICT 'VALUE 'OWN) P
OSITIVE)
      (SETQ NEW.VALUE (LIST "Reward Role Clarity"
                             (GET VALUE PERSON 'REWARD.SYS 'VALUE 'O
WN))))
      (PUT VALUE PERSON
        'ACHIEVEMENT
        (CONS NEW.VALUE (GET VALUE PERSON 'ACHIEVEMENT 'VA
LUE 'OWN))))
      (PUT VALUE PERSON
        'REALIZATION.OF.POTENTIAL
        (CONS NEW.VALUE
          (GET VALUE PERSON 'REALIZATION.OF.POTENTIAL
'VALUE 'OWN))))
      (PUT VALUE PERSON
        'JOB.SATISFACTION
        (CONS NEW.VALUE
          (GET VALUE PERSON 'JOB.SATISFACTION 'VALUE '
OWN))))
      (PUT VALUE PERSON
        'NEED.FULFILLMENT
        (CONS NEW.VALUE
          (GET VALUE PERSON 'NEED.FULFILLMENT 'VALUE '
OWN))))
      (T NIL))))

METHOD
(METHOD)
NIL
(COMMENT
  "Feedback (REWARD.SYS) is amplified under conditions of role clarity (ROL
E CONFLICT). Job satisfaction (ACHIEVEMENT, REALIZATION.OF.POTENTIAL, JOB SATISF
ACTION, NEED.FULFILLMENT) appear to increase when goals are established. (Mitche
ll, 1979).")
  (REWARD.WORK.R47
    (LAMBDA (THISUNIT PERSON)
      (PROG (NEW.VALUE)
        (COND ((GREATER THAN (GET VALUE PERSON 'REWARD.SYS 'VALUE 'OWN) POSI
TIVE)
              (SETQ NEW.VALUE (LIST "Reward Work"
                                     (GET VALUE PERSON 'REWARD.SYS 'VALUE 'O
WN))))
              (PUT VALUE PERSON
                'ACHIEVEMENT
                (CONS NEW.VALUE (GET VALUE PERSON 'ACHIEVEMENT 'VA
LUE 'OWN))))
              (PUT VALUE PERSON
                'EFFECTIVENESS
                (CONS NEW.VALUE (GET VALUE PERSON 'EFFECTIVENESS '
VALUE 'OWN))))
              (PUT VALUE PERSON
                'EFFICIENCY
                (CONS NEW.VALUE (GET VALUE PERSON 'EFFICIENCY 'VAL
UE 'OWN))))
              (PUT VALUE PERSON
                'REALIZATION.OF.POTENTIAL
                (CONS NEW.VALUE
                  (GET VALUE PERSON
                    'REALIZATION.OF.POTENTIAL
                    'VALUE
                    'OWN))))
              (T NIL))))

METHOD
(METHOD)
NIL
(COMMENT
  "If hard work leads to fair rewards (REWARD.SYS), then people work harder
(Expectancy theory) (ACHIEVEMENT, EFFECTIVENESS, EFFICIENCY, REALIZATION OF POTEN

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TIAL) (Lawler, 1970; Porter, Lawler, 1968a, Mitchell, 1979)."))))
  (REWARDS.SELF.ESTEEM.R51
    (LAMBDA (THISUNIT PERSON)
      (PROG (NEW.VALUE)
        (COND ((GREATER.THAN (GET.VALUE PERSON 'INTRINSIC.REWARD 'VALUE 'OWN
) POSITIVE)
          (SETQ NEW.VALUE (LIST "Rewards Self Esteem"
                                (GET.VALUE PERSON 'INTRINSIC.REWARD 'VA
LUE 'OWN)))
          (PUT.VALUE PERSON
            'JOB.SATISFACTION
            (CONS NEW.VALUE
              (GET.VALUE PERSON 'JOB.SATISFACTION 'VALUE '
OWN)))
          (PUT.VALUE PERSON
            'SELF.REALIZATION
            (CONS NEW.VALUE
              (GET.VALUE PERSON 'SELF.REALIZATION 'VALUE '
OWN)))
          (PUT.VALUE PERSON
            'ACHIEVEMENT
            (CONS NEW.VALUE (GET.VALUE PERSON 'ACHIEVEMENT 'VA
LUE 'OWN)))
          (PUT.VALUE PERSON
            'NEED.FULFILLMENT
            (CONS NEW.VALUE
              (GET.VALUE PERSON 'NEED.FULFILLMENT 'VALUE '
OWN))))))
      (T NIL))))
METHOD
(METHOD)
NIL
((COMMENT
  "Improved intrinsic rewards (INTRINSIC.REWARD) led to a feeling of self es
teem (JOB.SATISFACTION, SELF.REALIZATION), accomplishment (ACHIEVEMENT) and self
fulfilment (NEED.FULFILLMENT). (Lawler, 1969)."))
  (ROLE.CLARITY.R19
    (LAMBDA (THISUNIT PERSON)
      (PROG NIL
        (COND ((LESS.THAN (GET.VALUE PERSON 'ROLE.CONFLICT 'VALUE 'OWN) NEGA
TIVE)
          (PUT.VALUE PERSON
            'JOB.SATISFACTION
            (LIST "Role Clarity"
              (CONS (GET.VALUE PERSON 'ROLE.CONFLICT 'VALU
E 'OWN)
                (GET.VALUE PERSON 'JOB.SATISFACTION 'V
ALUE 'OWN))))))
          (T NIL))))
METHOD
(METHOD)
NIL
((COMMENT
  "Lack of role clarity (ROLE.CLARITY) is substantially related to job tensi
ons, turnover and proclivity to leave the job (JOB.SATISFACTION) (Lyons, 1971)
"))
  (SATISFACTION.COMM.ACHIEVEMENT.R39
    (LAMBDA (THISUNIT PERSON)
      (PROG (NEW.VALUE)
        (COND ((GREATER.THAN (GET.VALUE PERSON 'COMM.EFFECTIVENESS 'VALUE 'O
WN) POSITIVE)
          (SETQ NEW.VALUE (LIST "Satisfaction Comm Achievement"
                                (GET.VALUE PERSON 'COMM.EFFECTIVENESS '
VALUE 'OWN)))
          (PUT.VALUE PERSON
            'ACHIEVEMENT
            (CONS NEW.VALUE (GET.VALUE PERSON 'ACHIEVEMENT 'VA

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LUE 'OWN)))
      (PUT VALUE PERSON
        'NEED.FULFILLMENT
        (CONS NEW VALUE
          (GET.VALUE PERSON 'NEED.FULFILLMENT 'VALUE '
OWN)))
      (PUT VALUE PERSON
        'JOB.SATISFACTION
        (CONS NEW VALUE
          (GET.VALUE PERSON 'JOB.SATISFACTION 'VALUE '
OWN)))
      (PUT VALUE PERSON
        'REALIZATION.OF.POTENTIAL
        (CONS NEW VALUE
          (GET.VALUE PERSON
            'REALIZATION.OF.POTENTIAL
            'VALUE
            'OWN))))
      (T NIL))))

METHOD
(METHOD)
NIL
((COMMENT
  "When employees are satisfied with communications (COMM.EFFECTIVENESS), th
ey show a positive attitude towards management (ACHIEVEMENT, NEED.FULFILLMENT), a
re more satisfied with their supervisors (JOB.SATISFACTION) and identify more wit
h the organization (REALIZATION.OF.POTENTIAL). (Muchinsky, 1977) ""))
(SATISFACTION.COMM.R38
  (LAMBDA (THISUNIT PERSON)
    (PUT VALUE PERSON
      'JOB.SATISFACTION
      (LIST "Satisfaction Comm"
        (CONS (GET VALUE PERSON 'COMM.EFFECTIVENESS 'VALUE 'OWN)
          (GET.VALUE PERSON 'JOB.SATISFACTION 'VALUE 'OWN))))
    )
  )
METHOD
(METHOD)
NIL
((COMMENT
  "Job satisfaction (JOB.SATISFACTION) is related to a number of communicati
ons variables (COMM.EFFECTIVENESS). Roberts, O'Reilly, 1974) ""))
(SATISFACTION.ROLE.CLARITY.R33
  (LAMBDA (THISUNIT PERSON)
    (COND ((AND (GREATER.THAN (GET.VALUE PERSON 'ROLE.CONFLICT 'VALUE 'OWN) PO
SITIVE)
      (GREATER.THAN (GET.VALUE PERSON 'STANDARDS.GOALS 'VALUE 'OWN)
POSITIVE)
      (GREATER.THAN (GET.VALUE PERSON 'IND.ORG.CONTROL 'VALUE 'OWN)
POSITIVE)
      (LESS.THAN (GET.VALUE PERSON 'STRESS 'VALUE 'OWN) HIGH)
      (GREATER.THAN (GET.VALUE PERSON 'GROWTH.DEVELOPMENT 'VALUE 'OW
N) POSITIVE)
      (GREATER.THAN (GET.VALUE PERSON 'REWARD.SYS 'VALUE 'OWN) POSIT
IVE)))
      (PUT VALUE PERSON
        'JOB.SATISFACTION
        (LIST "Satisfaction Role Clarity"
          (CONS (AVERAGE OF (LIST (GET VALUE PERSON
            'ROLE.CONFLICT
            'VALUE
            'OWN)
            (GET VALUE PERSON
              'STANDARDS.GOAL
              'VALUE
              'OWN)
            (GET VALUE PERSON
              'IND.ORG.CONTROL
              'VALUE
              'OWN)
            (GET VALUE PERSON
              'GROWTH.DEVELOPMENT
              'VALUE
              'OWN)
            (GET VALUE PERSON
              'STRESS
              'VALUE
              'OWN)
            (GET VALUE PERSON
              'REWARD.SYS
              'VALUE
              'OWN)
            (GET VALUE PERSON
              'COMM.EFFECTIVENESS
              'VALUE
              'OWN)
            (GET.VALUE PERSON 'JOB.SATISFACTION 'VALUE 'OWN))))
          )
        )
      )
    )
  )

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                                'IND.ORG.CONTRO
L                                'VALUE
                                'OWN)
                                (GET.VALUE PERSON
                                'GROWTH DEVELOP
MENT.HO
                                'VALUE
                                'OWN)
                                (GET.VALUE PERSON
                                'REWARD.SYS
                                'VALUE
                                'OWN)))
                                (GET.VALUE PERSON 'JOB.SATISFACTION 'VALUE '
OWN)))))
                                (T NIL)))
                                METHOD
                                (METHOD)
                                NIL
                                ((COMMENT
                                "Job satisfaction (JOB.SATISFACTION) increases when clear goals (ROLE.CONF
                                LICT), goal planning (STANDARDS.GOALS), support and autonomy (IND.ORG.CONTROL),
                                job security (STRESS), development of capabilities (GROWTH.DEVELOPMENT.HO) and a
                                performance contingent reward system (REWARD.SYS). (Zultowski, Avery and Dewhirs
                                t, 1978)."))
                                (STANDARDS.AUTONOMY.R3
                                (LAMBDA (THISUNIT PERSON)
                                (PROG NIL
                                (COND ((AND (GREATER.THAN (GET.VALUE PERSON 'STANDARDS.GOALS 'VALUE
'OWN)
                                POSITIVE)
                                (GREATER.THAN (GET.VALUE PERSON 'IND.ORG.CONTROL 'VALUE
'OWN)
                                POSITIVE)))
                                (PUT.VALUE PERSON
                                'JOB.SATISFACTION
                                (LIST "Standards Autonomy"
                                (CONS (GET.VALUE PERSON 'IND.ORG.CONTROL 'VA
                                (GET.VALUE PERSON 'JOB.SATISFACTION 'VA
LUE 'OWN)
                                (GET.VALUE PERSON 'JOB.SATISFACTION 'VA
LUE 'OWN)))))
                                (T NIL))))
                                METHOD
                                (METHOD)
                                NIL
                                ((COMMENT
                                "Formalization and standarization (STANDARDS.GOALS) diminish satisfaction
                                (JOB.SATISFACTION) when there is a lack of autonomy (IND.ORG.CONTROL). (James an
                                d Jones, 1976)."))
                                (STANDARDS.CHALLENGE.R29
                                (LAMBDA (THISUNIT PERSON)
                                (PROG (NEW VALUE)
                                (COND ((AND (GREATER.THAN (GET VALUE PERSON 'STANDARDS.GOALS 'VALUE
'OWN)
                                POSITIVE)
                                (GREATER.THAN (GET VALUE PERSON 'JOB.CHALLENGE 'VALUE 'O
WN) POSITIVE)))
                                (SETQ NEW.VALUE (LIST "Standards Challenge"
                                (AVERAGE.OF (LIST (GET.VALUE PERSON
                                'STANDARDS
                                'VALUE
                                'OWN)
                                (GET.VALUE PERSON
                                'JOB.CHALL
                                'VALUE

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                                'OWN))))))
(PUT.VALUE PERSON
  'ACHIEVEMENT
  (CONS NEW.VALUE (GET.VALUE PERSON 'ACHIEVEMENT 'VA
LUE 'OWN)))
(PUT.VALUE PERSON
  'EFFECTIVENESS
  (CONS NEW.VALUE (GET.VALUE PERSON 'EFFECTIVENESS '
VALUE 'OWN)))
(PUT.VALUE PERSON
  'EFFICIENCY
  (CONS NEW.VALUE (GET.VALUE PERSON 'EFFICIENCY 'VAL
UE 'OWN)))
(PUT.VALUE PERSON
  'REALIZATION.OF.POTENTIAL
  (CONS NEW.VALUE
    (GET.VALUE PERSON
      'REALIZATION.OF.POTENTIAL
      'VALUE
      'OWN))))
(T NIL)))
METHOD
(METHOD)
NIL
((COMMENT
  "Specific goals (STANDARDS.GOALS) and challenging work (JOB.CHALLENGE) reg
ulate performance (ACHIEVEMENT, EFFECTIVENESS, EFFICIENCY, REALIZATION.OF.POTENTI
AL). (Locke, 1968, 1975)."))
(STANDARDS.COMM.R2
  (LAMBDA
    (THISUNIT PERSON)
    (PROG NIL
      (COND ((AND (GREATER.THAN (GET.VALUE PERSON 'STANDARDS.GOALS) POSITIV
E)
        (GREATER.THAN (GET.VALUE PERSON 'COMM.EFFECTIVENESS) POSI
TIVE))
        (PUT.VALUE PERSON
          'JOB.SATISFACTION
          (LIST "Standards Comm"
            (CONS (AVERAGE.OF (LIST (GET.VALUE PERSON
GOALS
                                'STANDARDS
                                'VALUE
                                'OWN)
                                (GET.VALUE PERSON
CTIVENESS
                                'COMM.EFFE
                                'VALUE
                                'OWN)))
            (GET.VALUE PERSON 'JOB.SATISFACTION 'VA
LUE 'OWN))))))
(T NIL)))
METHOD
(METHOD)
NIL
((COMMENT
  "Formalization and standardization (STANDARDS.GOALS) and lack of ambiguity
(COMM.EFFECTIVENESS) are positively related to satisfaction (JOB.SATISFACTION)
(James and Jones, 1976)."))
(STANDARDS.EXPENCTANT.REWARD.R48
  (LAMBDA
    (THISUNIT PERSON)
    (PROG
      (NEW.VALUE)
      (COND ((AND (GREATER.THAN (GET.VALUE PERSON 'STANDARDS.GOALS 'VALUE 'OWN)
POSITIVE,
        (GREATER.THAN (GET.VALUE PERSON 'REWARD.SYS 'VALUE 'OWN) POSIT

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IVE)
      (GREATER THAN (GET VALUE PERSON 'EXPECTATION OF REWARDS 'VALUE
      'OWN)
      POSITIVE))
      (SETQ NEW VALUE (LIST "Standards Expectant Reward"
      (AVERAGE OF (LIST (GET VALUE PERSON
      'STANDARDS GOALS
      'VALUE
      'OWN)
      (GET VALUE PERSON
      'REWARD SYS
      'VALUE
      'OWN)
      (GET VALUE PERSON
      'EXPECTATION OF
      'VALUE
      'OWN))))))
      (PUT VALUE PERSON
      'ACHIEVEMENT
      (CONS NEW VALUE (GET VALUE PERSON 'ACHIEVEMENT 'VALUE 'O
WN)))
      (PUT VALUE PERSON
      'EFFECTIVENESS
      (CONS NEW VALUE (GET VALUE PERSON 'EFFECTIVENESS 'VALUE
      'OWN)))
      (PUT VALUE PERSON
      'EFFICIENCY
      (CONS NEW VALUE (GET VALUE PERSON 'EFFICIENCY 'VALUE 'OW
N)))
      (PUT VALUE PERSON
      'REALIZATION OF POTENTIAL
      (CONS NEW VALUE
      (GET VALUE PERSON 'REALIZATION OF POTENTIAL 'VALUE
      'OWN))))
      (T NIL))))
      METHOD
      (METHOD)
      NIL
      ((COMMENT
      "Clear challenging goals (STANDARDS GOALS), reward distribution (REWARD SY
S) and expectations (EXPECTATION OF REWARDS) increase performance (ACHIEVEMENT, E
FFECTIVENESS, EFFICIENCY, REALIZATION OF POTENTIAL). (Mitchell, 1979) ")
      (STANDARDS R31
      (LAMBDA (THIS UNIT PERSON)
      (PROG (NEW VALUE)
      (COND (T
      (SETQ NEW VALUE (LIST "Standards"
      (GET VALUE PERSON 'STANDARDS GOALS 'VAL
UE 'OWN)))
      (PUT VALUE PERSON
      'ACHIEVEMENT
      (CONS NEW VALUE (GET VALUE PERSON 'ACHIEVEMENT 'VA
LUE 'OWN)))
      (PUT VALUE PERSON
      'EFFECTIVENESS
      (CONS NEW VALUE
      (GET VALUE PERSON 'EFFECTIVENESS 'VALUE 'OWN
      ))))))
      METHOD
      (METHOD)
      NIL
      ((COMMENT
      "Persons with assigned goals (STANDARDS GOALS) produced (ACHIEVEMENT, EFFEC
TIVENESS) more than those without assigned goals (White, Mitchell, Bell 1977) "
      (STANDARDS REWARDS R30

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(LAMBDA (THISUNIT PERSON)
  (PROG (NEW VALUE)
    (COND ((GREATER.THAN (GET.VALUE PERSON 'STANDARDS.GOALS 'VALUE 'OWN)
      POSITIVE)
      (SETQ NEW.VALUE (LIST "Standards Rewards"
        (AVERAGE.OF (LIST (GET.VALUE PERSON 'REWARD.SY
          S
            'VALUE 'OWN)
            (GET.VALUE PERSON 'JOB.CHALL
              ENGE
                'VALUE 'OWN))))))
      (PUT.VALUE PERSON 'ACHIEVEMENT
        (CONS NEW.VALUE (GET.VALUE PERSON 'ACHIEVEMENT 'VA
          LUE 'OWN)))
      (PUT.VALUE PERSON 'EFFECTIVENESS
        (CONS NEW.VALUE (GET.VALUE PERSON 'EFFECTIVENESS '
          VALUE 'OWN)))
      (PUT.VALUE PERSON 'EFFICIENCY
        (CONS NEW.VALUE (GET.VALUE PERSON 'EFFICIENCY 'VAL
          UE 'OWN)))
      (PUT.VALUE PERSON 'REALIZATION.OF.POTENTIAL
        (CONS NEW.VALUE
          (GET.VALUE PERSON 'REALIZATION.OF.POTENTIAL
            'VALUE 'OWN))))
      (T NIL))))
  METHOD
  (METHOD)
  NIL
  ((COMMENT
    "Incentives and rewards REWARD.SYS) are more readily linked with performan
    ce goals (ACHIEVEMENT, EFFECTIVENESS, EFFICIENCY, REALIZATION OF POTENTIAL) when
    goals are well defined (SANDARDS.GOALS). (Kirchhoff, 1975, Locke, 1968, 1975) ")
  ))
  (STRESS.FRUSTRATION.R18
    (LAMBDA (THISUNIT PERSON)
      (PROG (NEW VALUE)
        (COND ((GREATER.THAN (GET.VALUE PERSON 'STRESS 'VALUE 'OWN) HIGH)
          (SETQ NEW.VALUE (LIST "Stress Frustration"
            (- (GET.VALUE PERSON 'STRESS 'VALUE 'OW
              N))))
          (PUT.VALUE PERSON 'EFFECTIVENESS
            (CONS NEW.VALUE (GET.VALUE PERSON 'EFFECTIVENESS '
              VALUE 'OWN)))
          (PUT.VALUE PERSON 'ACHIEVEMENT
            (CONS NEW.VALUE (GET.VALUE PERSON 'ACHIEVEMENT 'VA
              LUE 'OWN)))
          (PUT.VALUE PERSON 'NEED.FULFILLMENT
            (CONS NEW.VALUE
              (GET.VALUE PERSON 'NEED.FULFILLMENT 'VALUE '
                OWN))))
          (T NIL))))
      METHOD
      (METHOD)
      NIL

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      ((COMMENT
        "Frustration (STRESS) leads to reduced productivity and lower morale (EFFE
CTIVENESS, ACHIEVEMENT, NEED.FULFILLMENT). (Lowrie, 1967)."))
      (STRESS.HEALTH.R14
        (LAMBDA (THISUNIT PERSON)
          (PROG (NEW.VALUE)
            (COND ((GREATER.THAN (GET.VALUE PERSON 'STRESS 'VALUE 'OWN) HIGH)
              (SETQ NEW.VALUE (LIST "Stress Health"
                (- (GET.VALUE PERSON 'STRESS 'VALUE 'OW
N))))))
              (PUT.VALUE PERSON
                'EFFICIENCY
                (CONS NEW.VALUE (GET.VALUE PERSON 'EFFICIENCY 'VAL
UE 'OWN))))
              (PUT.VALUE PERSON
                'EFFECTIVENESS
                (CONS NEW.VALUE (GET.VALUE PERSON 'EFFECTIVENESS '
VALUE 'OWN))))
              (PUT.VALUE PERSON
                'ACHIEVEMENT
                (CONS NEW.VALUE (GET.VALUE PERSON 'ACHIEVEMENT 'VA
LUE 'OWN))))
              (PUT.VALUE PERSON
                'EFFECTIVENESS
                (CONS NEW.VALUE (GET.VALUE PERSON 'EFFECTIVENESS '
VALUE 'OWN))))
              (PUT.VALUE PERSON
                'EFFICIENCY
                (CONS NEW.VALUE (GET.VALUE PERSON 'EFFICIENCY 'VAL
UE 'OWN))))
              (PUT.VALUE PERSON
                'REALIZATION.OF.POTENTIAL
                (CONS NEW.VALUE
                  (GET.VALUE PERSON
                    'REALIZATION.OF.POTENTIAL
                    'VALUE
                    'OWN))))
              (T NIL))))
        METHOD
        (METHOD)
        NIL
        ((COMMENT
          "Job stress (STRESS) provides a maladaptive response through adverse effec
ts on physical health (EFFICIENCY), mental health (EFFECTIVENESS) and performance
(ACHIEVEMENT EFFECTIVENESS, EFFICIENCY, REALIZATION OF POTENTIAL) (McLean, 19
74)."))
        (STRESS.SATISFACTION.R16
          (LAMBDA (THISUNIT PERSON)
            (PROG NIL
              (COND ((GREATER.THAN (GET.VALUE PERSON 'STRESS 'VALUE 'OWN) HIGH)
                (PUT.VALUE PERSON
                  'JOB.SATISFACTION
                  (LIST "Stress Satisfaction"
                    (- (GET.VALUE PERSON 'STRESS 'VALUE 'OWN))))
                (T NIL))))
            METHOD
            (METHOD)
            NIL
            ((COMMENT
              "An employees mental health (STRESS) varies consistently with job satisfac
tion (JOB.SATISFACTION) (Kornhauser, 1965)."))
            (STRESS.TURNOVER.R15
              (LAMBDA (THISUNIT PERSON)
                (PROG (NEW.VALUE)
                  (COND ((GREATER.THAN (GET.VALUE PERSON 'STRESS 'VALUE 'OWN) HIGH)
                    (SETQ NEW.VALUE (LIST "Stress Turnover"

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N))))
      (PUT.VALUE PERSON
        'ACHIEVEMENT
        (CONS NEW.VALUE (GET.VALUE PERSON 'ACHIEVEMENT 'VA
LUE 'OWN)))
      (PUT.VALUE PERSON
        'NEED.FULFILLMENT
        (CONS NEW.VALUE
          (GET.VALUE PERSON 'NEED.FULFILLMENT 'VALUE '
OWN))))
      (T NIL))))
METHOD
(METHOD)
NIL
((COMMENT
  "Excess stress (STRESS) has symptoms of changed work performance , high tu
rnover, absenteeism, lateness (ACHIEVEMENT, NEED.FULFILLMENT) (Schuler, 1980; M
argolis and Kroes, 1974)."))
(SUPPORT.COMM.TEAMWORK.R1
 (LAMBDA (THISUNIT PERSON)
  (PROG (NEW.VALUE)
    (COND ((AND (GREATER.THAN (AVERAGE.OF (LIST (GET.VALUE PERSON
ADEQUATE.ENV
'VALUE
'OWN)
(GET.VALUE PERSON
'IND.ORG.CONT
'VALUE
'OWN)
(GET.VALUE PERSON
'INTERPERSONA
'VALUE
'OWN))))
      POSITIVE)
    (GREATER.THAN (GET.VALUE PERSON 'COMM.EFFECTIVENESS 'VAL
UE 'OWN)
      POSITIVE)
    (GREATER.THAN (GET.VALUE PERSON 'INTRINSIC.REWARD 'VALUE
'OWN)
      POSITIVE)
    (GREATER.THAN (AVERAGE.OF (LIST (GET.VALUE PERSON
PERSONAL.REL
'VALUE
'OWN)
(GET.VALUE PERSON
TEAMWORK
'VALUE
'OWN))))
      POSITIVE)
    (GREATER.THAN (GET.VALUE PERSON 'TEAMWORK 'VALUE 'OWN) P
OSITIVE)
    (GREATER.THAN (GET.VALUE PERSON 'IND.ORG.CONTROL 'VALUE
'OWN)
      POSITIVE)
    (GREATER.THAN (GET.VALUE PERSON 'EFFECTIVE.PARTICIPATION
VALUE 'OWN)
      POSITIVE)
    (GREATER.THAN (AVERAGE.OF (LIST (GET.VALUE PERSON
TASK.COMPETE
'VALUE
'OWN)

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                                (GET VALUE PERSON
                                'INFLUENCE EN
                                'VALUE
                                'OWN)))
VIRONMENT
                                POSITIVE))
                                (SETQ NEW.VALUE (LIST "Support Comm Teamwork"
                                (AVERAGE OF (LIST (GET VALUE PERSON
                                'IND.ORG.C
                                'VALUE
                                'OWN)
                                (GET VALUE PERSON
                                'INTERPERS
                                'VALUE
                                'OWN)
                                (GET VALUE PERSON
                                'PHYSICAL.
                                'VALUE
                                'OWN))))))
                                (PUT VALUE PERSON
                                'SELF.REALIZATION
                                (CONS NEW.VALUE
                                (GET VALUE PERSON 'SELF.REALIZATION 'VALUE '
OWN)))
                                (PUT VALUE PERSON
                                'ACHIEVEMENT
                                (CONS NEW.VALUE (GET VALUE PERSON 'ACHIEVEMENT 'VA
LUE 'OWN)))
                                (PUT VALUE PERSON
                                'EXCELLENCE
                                (CONS NEW.VALUE (GET VALUE PERSON 'EXCELLENCE 'VAL
UE 'OWN)))
                                (PUT VALUE PERSON
                                'EFFECTIVENESS
                                (CONS NEW.VALUE (GET VALUE PERSON 'EFFECTIVENESS '
VALUE 'OWN)))
                                (PUT VALUE PERSON
                                'SELF.REALIZATION
                                (CONS NEW.VALUE
                                (GET VALUE PERSON 'SELF.REALIZATION 'VALUE '
OWN))))
                                (T NIL))))
METHOD
(METHOD)
NIL
(COMMENT
  "Mutual trust and support (ADEQUATE ENVIRONMENT, IND ORG CONTROL, INTERPER
SONAL REL), honest and open communications (COMM.EFFECTIVENESS), intrinsic motiva
tion (INTRINSIC REWARD), equalization of power (PERSONAL REL COMPETENCE), teamwor
k (TEAMWORK), individual control over methods (IND.ORG CONTROL), meaningful parti
cipation (EFFECTIVE PARTICIPATION), and bidirectional influence (TASK COMPETENCE,
INFLUENCE ENVIRONMENT) are all critical to individual growth (SELF REALIZATION),
achievement (ACHIEVEMENT), excellence (EXCELLENCE), and organizational effective
ness (EFFECTIVENESS) (Argyris, 1964, 1971, 1975, Bass, 1971, Bennis, 1966, Katz
and Kahn, 1966, Likert, 1961, 1967, Maslow, 1965, 1970, McGregor, 1960, 1967) "
)
TEAMWORK R28
(LAMBDA (THISUNIT PERSON)
  (PROG NIL
    (COND ((GREATER THAN (GET VALUE PERSON 'TEAMWORK 'VALUE 'OWN) POSITI
VE)
      (PUT VALUE PERSON
        'COHESIVE
        (LIST "Teamwork" (GET VALUE PERSON 'TEAMWORK 'VALU

```

```

E 'OWN))))
      (T NIL))))
      METHOD
      (METHOD)
      NIL
      ((COMMENT
        "Pride in group effectiveness (TEAMWORK) enhances cohesiveness (COHESIVENE
SS). (Newcombe, Turner, and Converse, 1965)."))))
      (TRUST SUPERVISOR R40
      (LAMBDA (THISUNIT PERSON)
        (PUT VALUE PERSON
          'REALIZATION OF POTENTIAL
          (LIST "Trust Supervisor"
            (CONS (GET VALUE PERSON 'LEADER SUPER 'VALUE 'OWN)
              (GET VALUE PERSON 'REALIZATION OF POTENTIAL 'VALUE
'OWN))))))
      METHOD
      (METHOD)
      NIL
      ((COMMENT
        "Employees who trust their supervisor (LEADER SUPER) identify better with
the organization (REALIZATION OF POTENTIAL). (Muchinsky, 1977)."))))
      (TWO WAY COMM R41
      (LAMBDA (THISUNIT PERSON)
        (PUT VALUE PERSON
          'EFFECTIVENESS
          (LIST "Two Way Comm"
            (CONS (GET VALUE PERSON 'COMM EFFECTIVENESS 'VALUE 'OWN)
              (GET VALUE PERSON 'EFFECTIVENESS 'VALUE 'OWN))))))
      METHOD
      (METHOD)
      NIL
      ((COMMENT
        "Greater organizational effectiveness (EFFECTIVENESS) is found when open,
two-way communications exist (COMM EFFECTIVENESS). (Rubin, Goldman, 1968)."))))
      ( ))

```

APPENDIX 15

COMPUTER LISTING OF INDIVIDUALS

This appendix lists the LISP computer code representing the frames which contribute to the class of Individuals. The member slots of Individuals are inherited from the other frames listed.

The form for a frame or unit is:

```
(Unit name
  (Creation and modification data)
  Superclasses list
  Member of list
  Comment
  Member slot list
  Own slot list)
```

The form for a slot is:

```
(Slot name
  Local value or program
  Inheritance role
  Value class
  Default value list
  Facet list or comment)
```

The form for a facet list is:

```
((Facet name
  Facet local value
  Facet role) ...)
```

```

(INDIVIDUALS
  ("HOLT" "27-Jan-1987 12:44:44" "HOLT" "21-Apr-1987 14:11:17")
  (IND.PERFORMANCE.MEASURES PERFORMANCE.OVERALL
    IND.PERFORMANCE.CALC
    IND.CLIMATE.VAR.CALC
    ATT.COMM.EFFECTIVENESS
    ATT.IND.ORG.CONTROL
    ATT.INTERPERSONAL.REL
    ATT.JOB.EVALUATION
    ATT.LEADER.SUPER
    ATT.PERSONAL.NEEDS
    ATT.PHYSICAL.ENVIR
    ATT.REWARD.SYS
    ATT.STANDARDS.GOALS
    ATT.STRESS
    CLIMATE.VARIABLES
    INTERMEDIATE.VAR.CALC
    INTERMEDIATE.VARIABLES)
  ((CLASSES.GENERICUNITS))
  NIL
  ()
  ())

(IND.PERFORMANCE.MEASURES
  ("HOLT" "9-Mar-1987 14:20:59" "HOLT" "9-Mar-1987 14:42:32")
  (PERFORMANCE)
  ((CLASSES.GENERICUNITS))
  NIL
  ((ACHIEVEMENT.NIL.NIL.NIL)
    (EFFECTIVENESS.NIL.NIL.NIL)
    (EFFICIENCY.NIL.NIL.NIL)
    (EXCELLENCE.NIL.NIL.NIL)
    (JOB.MOTIVATION.NIL.NIL.NIL.NIL ((COMMENT "Hackman and Oldham.")))
    (JOB.SATISFACTION.NIL.NIL.NIL)
    (NEED.FULFILLMENT.NIL.NIL.NIL)
    (REALIZATION.OF.POTENTIAL.NIL.NIL.NIL)
    (SELF.REALIZATION.NIL.NIL.NIL))
  ())

(PERFORMANCE.OVERALL
  ("HOLT" "2-Feb-1987 18:42:23" "HOLT" "10-Mar-1987 9:10:35")
  (PERFORMANCE)
  ((CLASSES.GENERICUNITS))
  NIL
  ((ACHIEVEMENT.OVERALL.NIL.NIL.#[ -1 1].NIL ((CARDINALITY.MAX (1))))
    (EFFECTIVENESS.OVERALL.NIL.NIL.#[ -1 1].NIL ((CARDINALITY.MAX (1))))
    (EFFICIENCY.OVERALL.NIL.NIL.#[ -1 1].NIL ((CARDINALITY.MAX (1))))
    (EXCELLENCE.OVERALL.NIL.NIL.#[ -1 1].NIL ((CARDINALITY.MAX (1))))
    (JOB.MOTIVATION.OVERALL.NIL.NIL.#[ -1 1].NIL ((CARDINALITY.MAX (1))))
    (JOB.SATISFACTION.OVERALL.NIL.NIL.#[ -1 1].NIL ((CARDINALITY.MAX (1))))
    (NEED.FULFILLMENT.OVERALL.NIL.NIL.#[ -1 1].NIL ((CARDINALITY.MAX (1))))
    (REALIZATION.OF.POTENTIAL.OVERALL.NIL.NIL.#[ -1 1].NIL ((CARDINALITY.MAX (1))))
    (SELF.REALIZATION.OVERALL.NIL.NIL.#[ -1 1].NIL ((CARDINALITY.MAX (1))))
  )
  ()

(IND.PERFORMANCE.CALC
  ("HOLT" "29-Jan-1987 13:16:35" "HOLT" "24-Feb-1987 15:05:04")
  (PERFORMANCE.CALC)
  ((CLASSES.GENERICUNITS))
  NIL
  ((ACHIEVEMENT.CALC (LAMBDA (THISUNIT)
    (PUT.VALUE THISUNIT
      'ACHIEVEMENT.OVERALL
      (AVERAGE.OF (GET.VALUES THISUNIT 'ACHIEVEMENT
        'VALUE 'OWN))))))
  METHOD

```



```

(METHOD))
(EFFECTIVENESS.CALC (LAMBDA (THISUNIT)
  (PUT.VALUE THISUNIT
    'EFFECTIVENESS.OVERALL
    (AVERAGE.OF (GET.VALUES THISUNIT
      'EFFECTIVENESS
      'VALUE
      'OWN))))))

METHOD
(METHOD))
(EFFICIENCY.CALC (LAMBDA (THISUNIT)
  (PUT.VALUE THISUNIT
    'EFFICIENCY.OVERALL
    (AVERAGE.OF (GET.VALUES THISUNIT 'EFFICIENCY 'V
      ALUE 'OWN))))))

METHOD
(METHOD))
(EXCELLENCE.CALC (LAMBDA (THISUNIT)
  (PUT.VALUE THISUNIT
    'EXCELLENCE.OVERALL
    (AVERAGE.OF (GET.VALUES THISUNIT 'EXCELLENCE 'V
      ALUE 'OWN))))))

METHOD
(METHOD))
(JOB.MOTIVATION.CALC (LAMBDA (THISUNIT)
  (PUT.VALUE THISUNIT
    'JOB.MOTIVATION.OVERALL
    (AVERAGE.OF (GET.VALUES THISUNIT
      'JOB.MOTIVATION
      'VALUE
      'OWN))))))

METHOD
(METHOD))
(JOB.SATISFACTION.CALC (LAMBDA (THISUNIT)
  (PUT.VALUE THISUNIT
    'JOB.SATISFACTION.OVERALL
    (AVERAGE.OF (GET.VALUES THISUNIT
      'JOB.SATISFACTION
      'VALUE
      'OWN))))))

METHOD
(METHOD))
(NEED.FULFILLMENT.CALC (LAMBDA (THISUNIT)
  (PUT.VALUE THISUNIT
    'NEED.FULFILLMENT.OVERALL
    (AVERAGE.OF (GET.VALUES THISUNIT
      'NEED.FULFILLMENT
      'VALUE
      'OWN))))))

METHOD
(METHOD))
(REALIZATION.OF.POTENTIAL.CALC
  (LAMBDA (THISUNIT)
    (PUT.VALUE THISUNIT
      'REALIZATION.OF.POTENTIAL.OVERALL
      (AVERAGE.OF (GET.VALUES THISUNIT 'REALIZATION.OF.POTENTIAL 'VAL
        DE 'OWN))))))

METHOD
(METHOD))
(REALIZATION.CALC (LAMBDA (THISUNIT)
  (PUT.VALUE THISUNIT
    'REALIZATION.OVERALL
    (AVERAGE.OF (GET.VALUES THISUNIT
      'REALIZATION
      'VALUE
      'OWN))))))

METHOD

```

```

(METHOD)))
(
(IND CLIMATE VAR CALC
("HOLT" "29-Jan-1987 9:04:35" "HOLT" "10-Feb-1987 20:22:11")
(CLIMATE CALC)
((CLASSES GENERICUNITS))
NIL
((COMM.EFFECTIVENESS.CALC
(LAMBDA (THISUNIT)
(PUT.VALUE THISUNIT
'COMM.EFFECTIVENESS
(AVERAGE.OF (LOOP FOR
ATTR
IN
(UNITSLOTNAMES 'ATT.COMM.EFFECTIVENESS 'MEMBE
R)
COLLECT
(GET.VALUE THISUNIT ATTR 'VALUE 'OWN))))))
METHOD
METHOD)
(IND.ORG.CONTROL.CALC (LAMBDA (THISUNIT)
(PUT.VALUE THISUNIT
'IND.ORG.CONTROL
(AVERAGE.OF (LOOP FOR
ATTR
IN
(UNITSLOTNAMES 'ATT.IND
ORG.CONTROL
'MEMBER)
COLLECT
(GET.VALUE THISUNIT
ATTR
'VALUE
'OWN))))))
METHOD
METHOD)
(INTERPERSONAL.REL.CALC
(LAMBDA (THISUNIT)
(PUT.VALUE THISUNIT
'INTERPERSONAL.REL
(AVERAGE.OF (LOOP FOR
ATTR
IN
(UNITSLOTNAMES 'ATT.INTERPERSONAL.REL 'MEMBER
)
COLLECT
(GET.VALUE THISUNIT ATTR 'VALUE 'OWN))))))
METHOD
METHOD)
(JOB.EVALUATION.CALC (LAMBDA (THISUNIT)
(PUT.VALUE THISUNIT
'JOB.EVALUATION
(AVERAGE.OF (LOOP FOR
ATTR
IN
(UNITSLOTNAMES 'ATT.JOB.E
VALUATION
'MEMBER)
COLLECT
(GET.VALUE THISUNIT
ATTR
'VALUE
'OWN))))))
METHOD
METHOD)
(LEADER.SUPER.CALC (LAMBDA (THISUNIT)

```

```

(PUT.VALUE THISUNIT
  'LEADER.SUPER
  (AVERAGE.OF (LOOP FOR
    ATTR
    IN
    (UNITSLOTNAMES 'ATT LEADER.
      'MEMBER)
    COLLECT
    (GET.VALUE THISUNIT ATTR 'V
      'OWN))))))
SUPER
  METHOD
  METHOD)
  (PERSONAL.NEEDS.CALC (LAMBDA (THISUNIT)
    (PUT.VALUE THISUNIT
      'PERSONAL.NEEDS
      (AVERAGE.OF (LOOP FOR
        ATTR
        IN
        (UNITSLOTNAMES 'ATT.PERSONAL.NEEDS
          'MEMBER)
        COLLECT
        (GET.VALUE THISUNIT
          ATTR
          'VALUE
          'OWN))))))
  METHOD
  METHOD)
  (PHYSICAL.ENVIR.CALC (LAMBDA (THISUNIT)
    (PUT.VALUE THISUNIT
      'PHYSICAL.ENVIR
      (AVERAGE.OF (LOOP FOR
        ATTR
        IN
        (UNITSLOTNAMES 'ATT.PHYSICAL.ENVIR
          'MEMBER)
        COLLECT
        (GET.VALUE THISUNIT
          ATTR
          'VALUE
          'OWN))))))
  METHOD
  METHOD)
  (REWARD.SYS.CALC (LAMBDA (THISUNIT)
    (PUT.VALUE THISUNIT
      'REWARD.SYS
      (AVERAGE.OF (LOOP FOR
        ATTR
        IN
        (UNITSLOTNAMES 'ATT.REWARD.SYS
          'MEMBER)
        COLLECT
        (GET.VALUE THISUNIT ATTR 'VAL
          'OWN))))))
  METHOD
  METHOD)
  (STANDARDS.GOALS.CALC (LAMBDA (THISUNIT)
    (PUT.VALUE THISUNIT
      'STANDARDS.GOALS
      (AVERAGE.OF (LOOP FOR
        ATTR
        IN
        (UNITSLOTNAMES 'ATT.STANDARDS.GOALS
          'MEMBER)

```

```

                                COLLECT
                                (GET VALUE THISUNIT
                                  ATTR
                                  'VALUE
                                  'OWN)))))

                                METHOD
                                METHOD)
(STRESS.CALC (LAMBDA (THISUNIT)
  (PUT.VALUE THISUNIT
    'STRESS
    (AVERAGE.OF (LOOP FOR
      ATTR
      IN
      (UNITSLOTNAMES 'ATT.STRESS 'MEMBE
R)
      COLLECT
      (GET.VALUE THISUNIT ATTR 'VALUE '
OWN)))))

                                METHOD
                                METHOD))

  ())

(ATTRIBUTES
  ("HOLT" "27-Jan-1987 11:54:06" "HOLT" "27-Jan-1987 11:59:52")
  NIL
  ((CLASSES GENERICUNITS))
  NIL
  ( )
  ( ))

(ATT.COMM.EFFECTIVENESS
  ("HOLT" "20-Jan-1987 13:17:17" "HOLT" "9-Feb-1987 21:49:19")
  (ATTRIBUTES)
  ((CLASSES GENERICUNITS))
  NIL
  ((ACCURATE.COMM
    NIL
    NIL
    #[-1 1]
    NIL
    ((CARDINALITY MAX (1)) (COMMENT "Directions and instructions received are ac
urate.")))
  (ANSWERS.AVAIL NIL NIL #[-1 1] NIL ((CARDINALITY MAX (1)) (COMMENT "Easy to g
et answers.")))
  (AVAIL.INFO NIL
    NIL
    #[-1 1]
    NIL
    ((CARDINALITY MAX (1)) (COMMENT "Info available when needed.")))
  (BELIEVABLE.COMM NIL
    NIL
    #[-1 1]
    NIL
    ((CARDINALITY MAX (1)) (COMMENT ("Can believe what I hear ab
out job "))))
  (CONVINCING NIL NIL #[-1 1] NIL ((CARDINALITY MAX (1)) (COMMENT "I can convin
ce others.")))
  (CORRESP.TIMELY NIL
    NIL
    #[-1 1]
    NIL
    ((CARDINALITY MAX (1)) (COMMENT "Coorespondance and reports a
re on time.")))
  (FREEDOM.OF.SPEECH NIL
    NIL
    #[-1 1]
    NIL

```

```

((CARDINALITY MAX (1)) (COMMENT "Can criticize openly.")))
(INFLUENCE.OTHERS NIL
  NIL
  #[-1 1]
  NIL
  ((CARDINALITY MAX (1)) (COMMENT "When I talk people listen.
")))
(INFO.AVAIL NIL
  NIL
  #[-1 1]
  NIL
  ((CARDINALITY MAX (1)) (COMMENT "Can find info if needed.")))
OPEN.COMMUNICATIONS
NIL
NIL
#[-1 1]
NIL
((CARDINALITY MAX (1)) (COMMENT "Can discuss anything about job with supervi
sor ")))
(REPORTS.TIMELY NIL
  NIL
  #[-1 1]
  NIL
  ((CARDINALITY MAX (1)) (COMMENT "Routine paperwork gets done.
")))
(SATISFIED.COMM NIL
  NIL
  #[-1 1]
  NIL
  ((CARDINALITY MAX (1)) (COMMENT "Happy with the way I get inf
o.")))
()
```

```

(ATT IND.ORG.CONTROL
  ("HOLT" "20-Jan-1987 11:35:40" "HOLT" "9-Feb-1987 20:36:58")
  (ATTRIBUTES)
  ((CLASSES GENERICUNITS))
  ""
  ((BELONGING
    NIL
    NIL
    #[-1 1]
    NIL
    ((CARDINALITY MAX (1)) (COMMENT "Secrist, McNee, Paden 1983. Feeling of bel
onging ")))
  (FAIRNESS
    NIL
    NIL
    #[-1 1]
    NIL
    ((CARDINALITY MAX (1)) (COMMENT "Secrist, McNee, Paden 1983 Suggestions co
nsidered ")))
  (LEVEL.SUPERVISION
    NIL
    NIL
    #[-1 1]
    NIL
    ((CARDINALITY MAX (1))
      (COMMENT "Secrist, McNee, Paden 1983 Closeness of supervision Reverse me
asure ")))
  (MANAGEMENT.RESPONS
    NIL
    NIL
    #[-1 1]
    NIL
    ((CARDINALITY MAX (1))
```

```

    (COMMENT "Secrist, McNee, Paden 1983. Responsive to suggestions.")))
(MANAGEMENT SUPPORT
  NIL
  NIL
  #[-1 1]
  NIL
  ((CARDINALITY MAX (1)) (COMMENT "Secrist, McNee, Paden 1983. Boss backs him
up.")))
(OPEN EXPRESSION
  NIL
  NIL
  #[-1 1]
  NIL
  ((CARDINALITY MAX (1)) (COMMENT "Secrist, McNee, Paden 1983. Express feelin
gs freely.")))
(PARTICIPATION DECISIONS
  NIL
  NIL
  #[-1 1]
  NIL
  ((CARDINALITY MAX (1))
    (COMMENT "Secrist, McNee, Paden 1983. Chance to part. in job related decis
ions.")))
(PARTICIPATION POLICY
  NIL
  NIL
  #[-1 1]
  NIL
  ((CARDINALITY MAX (1))
    (COMMENT "Secrist, McNee, Paden 1983. Chance to part. in forming policy."))
))
(PERSONAL JUDGEMENT
  NIL
  NIL
  #[-1 1]
  NIL
  ((CARDINALITY MAX (1))
    (COMMENT "Secrist, McNee, Paden 1983. Chance to use own judgement. Revers
e measure.")))
(RESTRICTIONS
  NIL
  NIL
  #[-1 1]
  NIL
  ((CARDINALITY MAX (1))
    (COMMENT
      "Secrist, McNee, Paden 1983. Regulations and procedures too restrictive.
Reverse measure ")))
(TRUST
  NIL
  NIL
  #[-1 1]
  NIL
  ((CARDINALITY MAX (1))
    (COMMENT "Secrist, McNee, Paden 1983. Boss trusts to do good job.")))
())

(ATT INTERPERSONAL REL
  ("HOLT" "20-Jan-1987 13:12:16" "HOLT" "9-Feb-1987 20:46:51")
  (ATTRIBUTES)
  ((CLASSES GENERIC UNITS))
  (CARE OF PEOPLE
    NIL
    NIL
    #[-1 1]

```

```

NIL
((CARDINALITY MAX (1))
 (COMMENT "Secrist, McNee, Paden 1983. Group takes care of people.")))
(COMPLAINTS
 NIL
 NIL
 #[-1 1]
 NIL
 ((CARDINALITY MAX (1))
 (COMMENT "Secrist, McNee, Paden 1983. Workers complain. Reverse measure."
 )))
(DESIRE.CHANGE
 NIL
 NIL
 #[-1 1]
 NIL
 ((CARDINALITY MAX (1))
 (COMMENT "Secrist, McNee, Paden 1983. Desire to be transferred. Reverse measure.")))
(DISSATISFACTION
 NIL
 NIL
 #[-1 1]
 NIL
 ((CARDINALITY MAX (1))
 (COMMENT "Secrist, McNee, Paden 1983. Dissatisfied with group. Reverse measure.")))
(ENJOYMENT
 NIL
 NIL
 #[-1 1]
 NIL
 ((CARDINALITY MAX (1))
 (COMMENT "Secrist, McNee, Paden 1983. Enjoy working with people in group "
 )))
(GET.ALONG
 NIL
 NIL
 #[-1 1]
 NIL
 ((CARDINALITY MAX (1))
 (COMMENT "Secrist, McNee, Paden 1983. Members of group get a long ")))
(GROUP.COORD
 NIL
 NIL
 #[-1 1]
 NIL
 ((CARDINALITY MAX (1))
 (COMMENT "Secrist, McNee, Paden 1983. Group works as coord. team ")))
(GROUP.PLEASURE
 NIL
 NIL
 #[-1 1]
 NIL
 ((CARDINALITY MAX (1))
 (COMMENT "Secrist, McNee, Paden 1983. Group pleasure in doing work. Reverse measure.")))
(MANAGEMENT CONCERN
 NIL
 NIL
 #[-1 1]
 NIL
 ((CARDINALITY MAX (1))
 (COMMENT "Secrist, McNee, Paden 1983. Management concerned with environment "
 )))
(QUARREL
 NIL

```

```

NIL
#[-1 1]
NIL
((CARDINALITY MAX (1))
 (COMMENT
  "Secrist, McNee, Paden 1983. Members quarrel and have bad feelings. Reverse measure.")))
(TENSION
 NIL
 NIL
 #[-1 1]
 NIL
 ((CARDINALITY MAX (1))
 (COMMENT
  "Secrist, McNee, Paden 1983. Tensions interfere with group. Reverse measure.")))
(UNCOOPERATIVE
 NIL
 NIL
 #[-1 1]
 NIL
 ((CARDINALITY MAX (1))
 (COMMENT
  "Secrist, McNee, Paden 1983. Uncooperative members of group. Reverse measure.")))
())

(ATT JOB EVALUATION
 ("HOLT" "20-Jan-1987 13:17:42" "HOLT" "9-Feb-1987 21:59:01")
 (ATTRIBUTES)
 ((CLASSES GENERIC UNITS))
 NIL
 ((BREADTH SIGNIFICANCE
  NIL
  NIL
  #[-1 1]
  NIL
  ((CARDINALITY MAX (1))
   (COMMENT "Hackman, Oldham 1980. Lots of people affected by my work.")))
 (ENJOY CHALLENGE
  NIL
  NIL
  #[-1 1]
  NIL
  ((CARDINALITY MAX (1)) (COMMENT "Hackman, Oldham 1980. Enjoy challenge of work.")))
 (GROWTH
  NIL
  NIL
  #[-1 1]
  NIL
  ((CARDINALITY MAX (1))
   (COMMENT "Hackman, Oldham 1980. Satisfied with personal growth and development.")))
 (INDEPENDENT THOUGHT
  NIL
  NIL
  #[-1 1]
  NIL
  ((CARDINALITY MAX (1))
   (COMMENT "Hackman, Oldham 1980. Have independent thought in work.")))
 (MEANINGFUL WORK
  NIL
  NIL
  #[-1 1]
  NIL

```



```

      ((CARDINALITY MAX (1)) (COMMENT "Hackman, Oldham 1980. Work meaningful to m
- ")))
      (PERSONAL.ACCOMPLISHMENT
      NIL
      NIL
      #[-1 1]
      NIL
      ((CARDINALITY MAX (1)) (COMMENT "Hackman, Oldham 1980. Feel worthwhile acco
mplishment.")))
      (REPETITIVE
      NIL
      NIL
      #[-1 1]
      NIL
      ((CARDINALITY MAX (1))
      (COMMENT "Hackman, Oldham 1980. Job is simple and repetitive. Reverse mea
sure.")))
      (SELF.FEEDBACK
      NIL
      NIL
      #[-1 1]
      NIL
      ((CARDINALITY MAX (1)) (COMMENT "Hackman, Oldham 1980. Can examine work for
feedback.")))
      (SKILL.VARIETY
      NIL
      NIL
      #[-1 1]
      NIL
      ((CARDINALITY MAX (1)) (COMMENT "Hackman, Oldham 1980. Requires many differ
ent skills.")))
      (STIMULATING.WORK
      NIL
      NIL
      #[-1 1]
      NIL
      ((CARDINALITY MAX (1))
      (COMMENT
      "Hackman, Oldham 1980. Work is stimulating and challenging. Reverse meas
ure ")))
      (TASK.IDENTITY
      NIL
      NIL
      #[-1 1]
      NIL
      ((CARDINALITY MAX (1))
      (COMMENT "Hackman, Oldham 1980. I take credit or blame for my work ")))
      (TASK.SIGNIFICANCE
      NIL
      NIL
      #[-1 1]
      NIL
      ((CARDINALITY MAX (1))
      (COMMENT "Hackman, Oldham 1980. Poor work can cause lots of problems ")))
      (TRIVIAL.WORK
      NIL
      NIL
      #[-1 1]
      NIL
      ((CARDINALITY MAX (1))
      (COMMENT "Hackman, Oldham 1980. Work seems trivial and useless. Reverse
measure ")))

```

ATT LEADER SUPER

"HOLT" "20-Jan-1987 13 16 21" "HOLT" "9-Feb-1987 21 01 24")

```

(ATTRIBUTES)
((CLASSES GENERICUNITS))
NIL
((SUP.ACCEPTANCE
  NIL
  NIL
  #[-1 1]
  NIL
  ((CARDINALITY.MAX (1))
    (COMMENT "Secrist, McNee, Paden 1983. Supervisor accepts me for what I am.
"))))
((SUP.APPRECIATIVE
  NIL
  NIL
  #[-1 1]
  NIL
  ((CARDINALITY.MAX (1))
    (COMMENT "Secrist, McNee, Paden 1983. Supervisor appreciates the work I do
"))))
((SUP.CONFIDENT
  NIL
  NIL
  #[-1 1]
  NIL
  ((CARDINALITY.MAX (1))
    (COMMENT "Secrist, McNee, Paden 1983 Supervisor is confident of his abili
ty "))))
((SUP.CONSIDERATE
  NIL
  NIL
  #[-1 1]
  NIL
  ((CARDINALITY.MAX (1))
    (COMMENT "Secrist, McNee, Paden 1983. Supervisor is considerate ")))
((SUP.CONVINCING
  NIL
  NIL
  #[-1 1]
  NIL
  ((CARDINALITY MAX (1)) (COMMENT "Secrist, McNee, Paden 1983. Supervisor is
convincing.")))
((SUP.COOPERATIVE
  NIL
  NIL
  #[-1 1]
  NIL
  ((CARDINALITY MAX (1))
    (COMMENT "Secrist, McNee, Paden 1983. Supervisor is cooperative ")))
((SUP.DECISIVE
  NIL
  NIL
  #[-1 1]
  NIL
  ((CARDINALITY MAX (1))
    (COMMENT "Secrist, McNee, Paden 1983 Supervisor makes decisions easily ")
))
((SUP.EFFECTIVE
  NIL
  NIL
  #[-1 1]
  NIL
  ((CARDINALITY MAX (1))
    (COMMENT "Secrist, McNee, Paden 1983 Supervisor knows what job needs to b
e done ")))
((SUP.EFFICIENT
  NIL
  NIL

```

```

#[-1 1]
NIL
((CARDINALITY MAX (1))
 (COMMENT "Secrist, McNee, Paden 1983. Supervisor does not waste timemateri
als.")))
(SUP. ENCOURAGING
 NIL
 NIL
#[-1 1]
 NIL
 ((CARDINALITY MAX (1))
 (COMMENT "Secrist, McNee, Paden 1983. Supervisor is encouraging.")))
(SUP. FAIR
 NIL
 NIL
#[-1 1]
 NIL
 ((CARDINALITY MAX (1)) (COMMENT "Secrist, McNee, Paden 1983. Supervisor is
fair.")))
(SUP. HELPFUL
 NIL
 NIL
#[-1 1]
 NIL
 ((CARDINALITY MAX (1)) (COMMENT "Secrist, McNee, Paden 1983. Supervisor is
helpful.")))
(SUP. IMAGINATIVE
 NIL
 NIL
#[-1 1]
 NIL
 ((CARDINALITY MAX (1)) (COMMENT "Secrist, McNee, Paden 1983. Supervisor is
creative.")))
(SUP. LEADER
 NIL
 NIL
#[-1 1]
 NIL
 ((CARDINALITY MAX (1)) (COMMENT "Secrist, McNee, Paden 1983. Supervisor is
a leader.")))
(SUP. PRODUCTIVE
 NIL
 NIL
#[-1 1]
 NIL
 ((CARDINALITY MAX (1))
 (COMMENT "Secrist, McNee, Paden 1983. Supervisor gets the right jobs done.
"))))
(SUP. SUPPORTIVE
 NIL
 NIL
#[-1 1]
 NIL
 ((CARDINALITY MAX (1)) (COMMENT "Secrist, McNee, Paden 1983. Supervisor sup
ports me ")))
( )

```

```

(ATT. PERSONAL NEEDS
 (Holt "20-Jan-1987 13 16 55" "HOLT" "9-Feb-1987 21 19 57")
 (ATTRIBUTES)
 (CLASSES GENERICUNITS))
NIL
(NEED FOR ADVANCEMENT
 NIL
 NIL
#[-1 1]

```

```

NIL
((CARDINALITY MAX (1)) (COMMENTS "Secrist, McNee, Paden 1983. I want to adv
ance.")))
(NEED.FOR.CHALLENGE
NIL
NIL
#[-1 1]
NIL
((CARDINALITY MAX (1)) (COMMENTS "Secrist, McNee, Paden 1983. I want more c
hallenge.")))
(NEED.FOR.COMPETENCE
NIL
NIL
#[-1 1]
NIL
((CARDINALITY MAX (1))
(COMMENTS "Secrist, McNee, Paden 1983. I want to be considered competent")
))
(NEED.FOR.COMPLIMENTS
NIL
NIL
#[-1 1]
NIL
((CARDINALITY MAX (1))
(COMMENTS "Secrist, McNee, Paden 1983. I want more compliments and recogni
tion.")))
(NEED.FOR.DIFFICULT.WORK
NIL
NIL
#[-1 1]
NIL
((CARDINALITY MAX (1))
(COMMENTS "Secrist, McNee, Paden 1983. I want more difficult work.")))
(NEED.FOR.FEEDBACK
NIL
NIL
#[-1 1]
NIL
((CARDINALITY MAX (1))
(COMMENTS "Hackman, Oldham 1980. I want more feed back about how I'm doing
.")))
(NEED.FOR.IMPRESSON
NIL
NIL
#[-1 1]
NIL
((CARDINALITY MAX (1))
(COMMENTS "Secrist, McNee, Paden 1983. I want to make a good impression."))
))
(NEED.FOR.INFLUENCE
NIL
NIL
#[-1 1]
NIL
((CARDINALITY MAX (1))
(COMMENTS "Secrist, McNee, Paden 1983. I want to influence my supervisors
."))
))
(NEED.FOR.INVOLVEMENT
NIL
NIL
#[-1 1]
NIL
((CARDINALITY MAX (1))
(COMMENTS "Secrist, McNee, Paden 1983. I want to be more involved with my
work."))
))
(NEED.FOR.JOB.SECURITY
NIL

```

```

NIL
#[-1 1]
NIL
((CARDINALITY MAX (1))
 (COMMENTS "Secrist, McNee, Paden 1983. I want more job security.")))
(NEED.FOR.LESS.SUPERVISION
 NIL
 NIL
 #[-1 1]
 NIL
 ((CARDINALITY MAX (1)) (COMMENTS "Secrist, McNee, Paden 1983. I want less s
upervision"))))
(NEED.FOR.PAY.TIME
 NIL
 NIL
 #[-1 1]
 NIL
 ((CARDINALITY MAX (1))
 (COMMENTS "Secrist, McNee, Paden 1983. I want better pay or more time off.
"))))
(NEED.FOR.PERFORMANCE
 NIL
 NIL
 #[-1 1]
 NIL
 ((CARDINALITY MAX (1))
 (COMMENTS "Secrist, McNee, Paden 1983. I want better performance ratings "
)))
(NEED.FOR.PROMOTION
 NIL
 NIL
 #[-1 1]
 NIL
 ((CARDINALITY MAX (1))
 (COMMENTS "Secrist, McNee, Paden 1983. I want faster promotions ")))
(NEED.FOR.RESPONS
 NIL
 NIL
 #[-1 1]
 NIL
 ((CARDINALITY MAX (1))
 (COMMENTS "Secrist, McNee, Paden 1983. I want more responsibility.")))
(NEED.FOR.SELF.CONTROL
 NIL
 NIL
 #[-1 1]
 NIL
 ((CARDINALITY MAX (1))
 (COMMENTS "Secrist, McNee, Paden 1983 I want more control over my work "
)))
(NEED.FOR.VOLUME
 NIL
 NIL
 #[-1 1]
 NIL
 ((CARDINALITY MAX (1)) (COMMENTS "Secrist, McNee, Paden 1983. I want to do
more work ")))
( )

```

```

PATT PHYSICAL ENVIR
 ("HOLT" "20-Jan-1987 13 18 10" "HOLT" "9-Feb-1987 22 06 10")
 (ATTRIBUTES)
 (CLASSES GENERICUNITS))
 NIL
 ((ADDITIONAL EQUIPMENT
  NIL

```

```

NIL
#[-1 1]
NIL
((CARDINALITY MAX (1)) (COMMENT "If needed to improve work, equipment is available.")))
(ADDITIONAL MONEY
NIL
NIL
#[-1 1]
NIL
((CARDINALITY MAX (1)) (COMMENT "If needed to improve work, money is available.")))
(ADEQUATE MONEY NIL
NIL
#[-1 1]
NIL
((CARDINALITY MAX (1)) (COMMENT "Seems to be enough money to do work.")))
(ADEQUATE WORK SPACE
NIL
NIL
#[-1 1]
NIL
((CARDINALITY MAX (1)) (COMMENT "Facilities are adequate for work assigned.")))
(ADJUSTABLE SURROUNDINGS
NIL
NIL
#[-1 1]
NIL
((CARDINALITY MAX (1)) (COMMENT "Can adjust appearance and arrangement of surroundings.")))
(APPROPRIATE PLACE NIL
NIL
#[-1 1]
NIL
((CARDINALITY MAX (1)) (COMMENT "Work site is appropriate for work.")))
(AVAIL MONEY NIL
NIL
#[-1 1]
NIL
((CARDINALITY MAX (1)) (COMMENT "Money is available for special needs.")))
(CORRECT EQUIP NIL
NIL
#[-1 1]
NIL
((CARDINALITY MAX (1)) (COMMENT "Right kind of equipment is available.")))
(ENOUGH EQUIPMENT NIL
NIL
#[-1 1]
NIL
((CARDINALITY MAX (1)) (COMMENT "Enough equipment is available.")))
(EQUIPMENT USE NIL
NIL
#[-1 1]
NIL
((CARDINALITY MAX (1)) (COMMENT "Can influence way equipment is used.")))
(FLEXIBLE SURROUNDINGS
NIL
NIL
#[-1 1]
NIL

```

```

      ((CARDINALITY MAX (1)) (COMMENT "Can rearrange work space if desired.")))
      (INFLUENCE SPENDING NIL
        NIL
        #[-1 1]
        NIL
        ((CARDINALITY MAX (1)) (COMMENT "Can influence way money
is spent.")))
      ()))

(ATT.REWARD.SYS
  ("HOLT" "20-Jan-1987 13:16:33" "HOLT" "9-Feb-1987 21:14:09")
  (ATTRIBUTES)
  ((CLASSES GENERICUNITS))
  NIL
  ((ADVANCEMENT
    NIL
    NIL
    #[-1 1]
    NIL
    ((CARDINALITY MAX (1))
      (COMMENT "Secrist, McNee, Paden 1983. Good work gives chance to advance"))
  )
  (CHALLENGING.WORK
    NIL
    NIL
    #[-1 1]
    NIL
    ((CARDINALITY MAX (1))
      (COMMENT "Secrist, McNee, Paden 1983. Good work give more challenging work
  )))
  (COMPETENT
    NIL
    NIL
    #[-1 1]
    NIL
    ((CARDINALITY MAX (1))
      (COMMENT "Secrist, McNee, Paden 1983. Good work means being considered com
petent ")))
  (COMPLIMENTS
    NIL
    NIL
    #[-1 1]
    NIL
    ((CARDINALITY MAX (1))
      (COMMENT "Secrist, McNee, Paden 1983. Good work earns compliments and reco
gnition ")))
  (DIFFICULT WORK REWARD
    NIL
    NIL
    #[-1 1]
    NIL
    ((CARDINALITY MAX (1))
      (COMMENT
        "Secrist, McNee, Paden 1983 Good work earns assignment of more difficult
work ")))
  (FEEDBACK
    NIL
    NIL
    #[-1 1]
    NIL
    ((CARDINALITY MAX (1))
      (COMMENT "Hackman, Oldham 1980 Supervisor lets me know how I'm is doing "
  )
  (GROUP FEEDBACK
    NIL
    NIL

```

```

#[-1 1]
NIL
((CARDINALITY.MAX (1))
 (COMMENT "Hackman, Oldham 1980. In group, people know how well they are do
ing ")))
(IMPRESSIVE.WORK
 NIL
 NIL
 #[-1 1]
 NIL
 ((CARDINALITY.MAX (1))
 (COMMENT "Secrist, McNee, Paden 1983. Supervisor will be impressed by good
work.")))
(INFLUENCE
 NIL
 NIL
 #[-1 1]
 NIL
 ((CARDINALITY.MAX (1))
 (COMMENT "Secrist, McNee, Paden 1983. Good work earns influence.")))
(INVOLVEMENT
 NIL
 NIL
 #[-1 1]
 NIL
 ((CARDINALITY.MAX (1))
 (COMMENT "Secrist, McNee, Paden 1983. Good work earns involvement.")))
(JOB.SECURITY
 NIL
 NIL
 #[-1 1]
 NIL
 ((CARDINALITY.MAX (1))
 (COMMENT "Secrist, McNee, Paden 1983. Good work earns job security ")))
(LESS.SUPERVISION
 NIL
 NIL
 #[-1 1]
 NIL
 ((CARDINALITY.MAX (1))
 (COMMENT "Secrist, McNee, Paden 1983. Good work earns less supervison.")))
(PAY.TIME
 NIL
 NIL
 #[-1 1]
 NIL
 ((CARDINALITY.MAX (1))
 (COMMENT "Secrist, McNee, Paden 1983. Good work earns better paymore time
off ")))
(PERFORMANCE.RATING
 NIL
 NIL
 #[-1 1]
 NIL
 ((CARDINALITY.MAX (1))
 (COMMENT "Secrist, McNee, Paden 1983. Good work earns better ratings ")))
(PROMOTION
 NIL
 NIL
 #[-1 1]
 NIL
 ((CARDINALITY.MAX (1))
 (COMMENT "Secrist, McNee, Paden 1983. Good work earns faster promotion ")))
(RESPONSIBILITY
 NIL
 NIL

```



```

#[-1 1]
NIL
((CARDINALITY MAX (1))
  (COMMENT "Secrist, McNee, Paden 1983. Good work earns more responsibility.
"))
(SELF-CONTROL
  NIL
  NIL
  #[-1 1]
  NIL
  ((CARDINALITY MAX (1))
    (COMMENT "Secrist, McNee, Paden 1983. Good work earns freedom to plan own
work.")))
(VOLUME-WORK
  NIL
  NIL
  #[-1 1]
  NIL
  ((CARDINALITY MAX (1))
    (COMMENT "Secrist, McNee, Paden 1983. Good work earns more work.")))
())

(ATT-STANDARDS-GOALS
  ("HOLT" "20-Jan-1987 13:18:28" "HOLT" "9-Feb-1987 22:13:04")
  (ATTRIBUTES)
  ((CLASSES GENERICUNITS))
  NIL
  ((ABILITY-TO-DO-WORK NIL
    NIL
    #[-1 1]
    NIL
    ((CARDINALITY MAX (1)) (COMMENT "I can do work assigned."
)))
  (AGREEABLE-GOALS
    NIL
    NIL
    #[-1 1]
    NIL
    ((CARDINALITY MAX (1)) (COMMENT "Understand and agree with goals and objecti
ves ")))
  (CONFUSED-EXPECTATIONS
    NIL
    NIL
    #[-1 1]
    NIL
    ((CARDINALITY MAX (1)) (COMMENT "Not sure what is expected Reverse measure
"))
  (DIFFICULT-WORK NIL
    NIL
    #[-1 1]
    NIL
    ((CARDINALITY MAX (1)) (COMMENT "Work is hard and uses my abi
ilities ")))
  (GOAL-ACHIEVEMENT NIL
    NIL
    #[-1 1]
    NIL
    ((CARDINALITY MAX (1)) (COMMENT "Feel good when meet or exc
eed goals ")))
  (KNOWLEDGE-OF-JOB NIL
    NIL
    #[-1 1]
    NIL
    ((CARDINALITY MAX (1)) (COMMENT "I know a lot about job ")))
  (NEEDED-WORK NIL

```

```

NIL
#[-1 1]
NIL
((CARDINALITY MAX (1)) (COMMENT "Work done needed to be done."))
)
(NEGLECTED WORK
NIL
NIL
#[-1 1]
NIL
((CARDINALITY MAX (1)) (COMMENT "Much work doesn't get done. Reverse measur
e."))))
(OVERLOADED
NIL
NIL
#[-1 1]
NIL
((CARDINALITY MAX (1)) (COMMENT "Too much to do. Rarely on time. Reverse m
easure."))))
(TASK CONTINUITY NIL
NIL
#[-1 1]
NIL
((CARDINALITY MAX (1)) (COMMENT "I finish the same work I st
art."))))
(WORK IDENTITY
NIL
NIL
#[-1 1]
NIL
((CARDINALITY MAX (1))
(COMMENT "Hackman, Oldham 1980. Others know how well I did on a job."))))
())

(ATT STRESS
("HOLT" "20-Jan-1987 13:14:17" "HOLT" "9-Feb-1987 20:53:55")
(ATTRIBUTES)
((CLASSES GENERICUNITS))
...)
((APPEAR BUSY
NIL
NIL
#[-1 1]
NIL
((CARDINALITY MAX (1)) (COMMENTS "Secrist, McNee, Paden 1983 Have to look
busy."))))
(CONFLICT ASSIGNMENT
NIL
NIL
#[-1 1]
NIL
((CARDINALITY MAX (1))
(COMMENTS "Secrist, McNee, Paden 1983. Receive conflicting assignments. "))
)
(CONFLICT DEMANDS
NIL
NIL
#[-1 1]
NIL
((CARDINALITY MAX (1))
(COMMENTS "Secrist, McNee, Paden 1983 Management gives conflicting demand
s. "))
(CONFLICT VALUES
NIL
NIL
#[-1 1]

```

```

NIL
((CARDINALITY MAX (1))
(COMMENTS "Secrist, McNee, Paden 1983. Expected to act against own judgement.")))
(CONFUSED.PLANNING
NIL
NIL
#[-1 1]
NIL
((CARDINALITY MAX (1))
(COMMENTS "Secrist, McNee, Paden 1983. Confused planning and organization of work.")))
(INFORMATION.AVAIL
NIL
NIL
#[-1 1]
NIL
((CARDINALITY MAX (1))
(COMMENTS "Secrist, McNee, Paden 1983. Can get information needed. Reverse measure.")))
(LACK.OF.AUTHORITY
NIL
NIL
#[-1 1]
NIL
((CARDINALITY MAX (1))
(COMMENTS
"Secrist, McNee, Paden 1983. Given enough authority to carry out work. Reverse measure.")))
(LACK.OF.INFLUENCE
NIL
NIL
#[-1 1]
NIL
((CARDINALITY MAX (1))
(COMMENTS "Secrist, McNee, Paden 1983. Ability to influence decisions affecting self.")))
(PRESSURE
NIL
NIL
#[-1 1]
NIL
((CARDINALITY MAX (1))
(COMMENTS "Secrist, McNee, Paden 1983. Organization generates pressure.")))
)
(UNCLEAR.RESPONS
NIL
NIL
#[-1 1]
NIL
((CARDINALITY MAX (1))
(COMMENTS "Secrist, McNee, Paden 1983. Job responsibilities are unclear."))
))
(UNNECESSARY.ATTEN
NIL
NIL
#[-1 1]
NIL
((CARDINALITY MAX (1))
(COMMENTS "Secrist, McNee, Paden 1983. Too much attention to unimportant details.")))
(USE.OF.RESOURCES
NIL
NIL
#[-1 1]
NIL
((CARDINALITY MAX (1))

```

```

      (COMMENTS "Secrist, McNee, Paden 1983. Organizations use of men, money and
material.")))
    ())

(CLIMATE.VARIABLES
  ("HOLT" "27-Jan-1987 11:55:43" "HOLT" "3-Feb-1987 23:07:53")
  (VARIABLES)
  ((CLASSES GENERICUNITS))
  NIL
  ((COMM.EFFECTIVENESS NIL NIL #[-1 1] NIL ((CARDINALITY.MAX (1)) (COMMENT "Secr
st 1983"))))
  (IND.ORG.CONTROL NIL NIL #[-1 1] NIL ((CARDINALITY.MAX (1)) (COMMENT "Secrist
1983"))))
  (INTERPERSONAL.REL NIL NIL #[-1 1] NIL ((CARDINALITY.MAX (1)) (COMMENT "Secri
st 1983"))))
  (JOB.EVALUATION NIL
    NIL
    #[-1 1]
    NIL
    ((CARDINALITY.MAX (1)) (COMMENT "Hackman and Oldham 1980"))))
  (LEADER.SUPER NIL NIL #[-1 1] NIL ((CARDINALITY.MAX (1)) (COMMENT "Secrist 19
83"))))
  (PERSONAL.NEEDS NIL NIL #[-1 1] NIL ((CARDINALITY.MAX (1)) (COMMENT "Secrist
1983"))))
  (PHYSICAL.ENVIR NIL NIL #[-1 1] NIL ((CARDINALITY.MAX (1)) (COMMENT "Secrist
1983"))))
  (REWARD.SYS NIL NIL #[-1 1] NIL ((CARDINALITY.MAX (1)) (COMMENT "Secrist 1983
"))))
  (STANDARDS.GOALS NIL NIL #[-1 1] NIL ((CARDINALITY.MAX (1)) (COMMENT "Secrist
1983"))))
  (STRESS NIL NIL #[-1 1] NIL ((CARDINALITY.MAX (1)) (COMMENT "Secrist 1983"))))
  )
  ())

(INTERMEDIATE.VAR.CALC
  ("HOLT" "27-Jan-1987 11:55:04" "HOLT" "13-Feb-1987 15:08:27")
  (CLIMATE.CALC)
  ((CLASSES GENERICUNITS))
  NIL
  ((ADEQUATE.ENVIRONMENT.CALC
    (LAMBDA (THISUNIT)
      (PUT.VALUE THISUNIT
        'ADEQUATE.ENVIRONMENT
        (AVERAGE.OF (LOOP FOR
          ATT.VALUE
          IN
          (GET VALUES 'INTERMEDIATE.VARIABLES
            'ADEQUATE.ENVIRONMENT MEMBERS
            'VALUE
            'OWN)
          COLLECT
          (GET VALUE THISUNIT ATT VALUE 'VALUE 'OWN))))))
  )

  METHOD
  (METHOD))
  (EFFECTIVE.PARTICIPATION.CALC
    (LAMBDA (THISUNIT)
      (PUT VALUE THISUNIT
        'EFFECTIVE.PARTICIPATION
        (AVERAGE.OF (LOOP FOR
          ATT.VALUE
          IN
          (GET VALUES 'INTERMEDIATE.VARIABLES
            'EFFECTIVE.PARTICIPATION MEMBERS
            'VALUE
            'OWN)
          COLLECT

```

```

)
    (GET.VALUE THISUNIT ATT VALUE 'VALUE 'OWN)))
METHOD
(METHOD))
(EXPECTATION.OF.REWARDS.CALC
(LAMBDA (THISUNIT)
(PUT.VALUE THISUNIT
'EXPECTATION.OF.REWARDS
(AVERAGE.OF (LOOP FOR
ATT.VALUE
IN
(GET.VALUES 'INTERMEDIATE.VARIABLES
'EXPECTATION.OF.REWARDS MEMBERS
'VALUE
'OWN)
COLLECT
(GET.VALUE THISUNIT ATT.VALUE 'VALUE 'OWN))))
)
METHOD
(METHOD))
(EXTRINSIC.REWARD.CALC
(LAMBDA (THISUNIT)
(PUT.VALUE THISUNIT
'EXTRINSIC.REWARD
(AVERAGE.OF (LOOP FOR
ATT.VALUE
IN
(GET.VALUES 'INTERMEDIATE.VARIABLES
'EXTRINSIC.REWARD.MEMBERS
'VALUE
'OWN)
COLLECT
(GET.VALUE THISUNIT ATT.VALUE 'VALUE 'OWN))))
)
METHOD
(METHOD))
(GROWTH.DEVELOP.CALC (LAMBDA (THISUNIT)
(PUT.VALUE THISUNIT
'GROWTH.DEVELOP
(AVERAGE.OF (LOOP FOR
ATT.VALUE
IN
(GET.VALUES 'INTERMEDIATE
'GROWTH.DEVEL
'VALUE
'OWN)
COLLECT
(GET.VALUE THISUNIT
ATT.VALUE
'VALUE
'OWN))))))
VARIABLES
OP MEMBERS
METHOD
(METHOD))
(IMPORTANCE.OF.REWARDS.CALC
(LAMBDA (THISUNIT)
(PUT.VALUE THISUNIT
'IMPORTANCE.OF.REWARDS
(AVERAGE.OF (LOOP FOR
ATT.VALUE
IN
(GET.VALUES 'INTERMEDIATE.VARIABLES
'IMPORTANCE.OF.REWARDS MEMBERS
'VALUE
'OWN)
COLLECT

```

```

)
    (GET.VALUE THISUNIT ATT.VALUE 'VALUE 'OWN)))
)
    METHOD
    (METHOD))
    (INFLUENCE.ENVIRONMENT.CALC
    (LAMBDA (THISUNIT)
    (PUT.VALUE THISUNIT
    'INFLUENCE.ENVIRONMENT
    (AVERAGE.OF (LOOP FOR
    ATT.VALUE
    IN
    (GET.VALUES 'INTERMEDIATE.VARIABLES
    'INFLUENCE.ENVIRONMENT.MEMBERS
    'VALUE
    'OWN)
    COLLECT
    (GET.VALUE THISUNIT ATT.VALUE 'VALUE 'OWN))))
)
    METHOD
    (METHOD))
    (INTRINSIC.REWARD.CALC
    (LAMBDA (THISUNIT)
    (PUT.VALUE THISUNIT
    'INTRINSIC.REWARD
    (AVERAGE.OF (LOOP FOR
    ATT.VALUE
    IN
    (GET.VALUES 'INTERMEDIATE.VARIABLES
    'INTRINSIC.REWARD.MEMBERS
    'VALUE
    'OWN)
    COLLECT
    (GET.VALUE THISUNIT ATT.VALUE 'VALUE 'OWN))))
)
    METHOD
    (METHOD))
    (JOB.CHALLENGE.CALC (LAMBDA (THISUNIT)
    (PUT.VALUE THISUNIT
    'JOB.CHALLENGE
    (AVERAGE.OF (LOOP FOR
    ATT.VALUE
    IN
    (GET.VALUES 'INTERMEDIATE.
VARIABLES
    'JOB.CHALLENGE
    'VALUE
    'OWN)
    COLLECT
    (GET.VALUE THISUNIT
    ATT.VALUE
    'VALUE
    'OWN))))
)
    METHOD
    (METHOD))
    (OVERALL.CLIMATE.CALC
    (LAMBDA (THISUNIT)
    (PUT.VALUE THISUNIT
    'OVERALL.CLIMATE
    (AVERAGE.OF (LOOP FOR
    ATT.VALUE
    IN
    (GET.VALUES 'INTERMEDIATE.VARIABLES
    'OVERALL.CLIMATE.MEMBERS
    'VALUE
    'OWN)
    COLLECT

```

```

)
    (GET.VALUE THISUNIT ATT.VALUE 'VALUE 'OWN)))
)
    METHOD
    (METHOD)
    NIL
    ((COMMENT
      ("This calculation should occur after other climate variables have been ca
culated.")))
    (PERSONAL.REL.COMPETENCE.CALC
      (LAMBDA (THISUNIT)
        (PUT.VALUE THISUNIT
          'PERSONAL.REL.COMPETENCE
          (AVERAGE.OF (LOOP FOR
            ATT.VALUE
            IN
            (GET.VALUES 'INTERMEDIATE.VARIABLES
              'PERSONAL.REL.COMPETENCE.MEMBERS
              'VALUE
              'OWN)
            COLLECT
            (GET.VALUE THISUNIT ATT.VALUE 'VALUE 'OWN))))))
)
    METHOD)
    (ROLE.CONFLICT.CALC (LAMBDA (THISUNIT)
      (PUT.VALUE THISUNIT
        'ROLE.CONFLICT
        (AVERAGE.OF (LOOP FOR
          ATT.VALUE
          IN
          (GET.VALUES 'INTERMEDIATE.
            'ROLE.CONFLICT
            'VALUE
            'OWN)
          COLLECT
          (GET.VALUE THISUNIT
            ATT.VALUE
            'VALUE
            'OWN))))))
)
    METHOD
    (METHOD))
    (SATISFACTION.WITH.GROUP.CALC
      (LAMBDA (THISUNIT)
        (PUT.VALUE THISUNIT
          'SATISFACTION.WITH.GROUP
          (AVERAGE.OF (LOOP FOR
            ATT.VALUE
            IN
            (GET.VALUES 'INTERMEDIATE.VARIABLES
              'SATISFACTION.WITH.GROUP.MEMBERS
              'VALUE
              'OWN)
            COLLECT
            (GET.VALUE THISUNIT ATT.VALUE 'VALUE 'OWN))))))
)
    METHOD
    (METHOD))
    (SKILL.VARIETY.HO.CALC
      (LAMBDA (THISUNIT)
        (PUT.VALUE THISUNIT
          'SKILL.VARIETY.HO
          (AVERAGE.OF (LOOP FOR
            ATT.VALUE
            IN
            (GET.VALUES 'INTERMEDIATE.VARIABLES
              'SKILL.VARIETY.HO.MEMBERS

```

```

                                'VALUE
                                'OWN)
                                COLLECT
                                (GET.VALUE THISUNIT ATT.VALUE 'VALUE 'OWN)))
)
  METHOD
  (METHOD))
  (TASK.COMPETENCE.CALC (LAMBDA (THISUNIT)
    (PUT.VALUE THISUNIT
      'TASK.COMPETENCE
      (AVERAGE.OF (LOOP FOR
        ATT.VALUE
        IN
        (GET.VALUES 'INTERMEDIAT
          'TASK.COMPET
            'VALUE
            'OWN)
            COLLECT
            (GET.VALUE THISUNIT
              ATT.VALUE
              'VALUE
              'OWN))))))
E.VARIABLES
ENCE.MEMBERS
                                METHOD
                                (METHOD))
                                (TEAMWORK.CALC (LAMBDA (THISUNIT)
                                  (PUT.VALUE THISUNIT
                                    'TEAMWORK
                                    (AVERAGE.OF (LOOP FOR
                                      ATT.VALUE
                                      IN
                                      (GET.VALUES 'INTERMEDIATE VARIA
                                        'TEAMWORK.MEMBERS
                                        'VALUE
                                        'OWN)
                                        COLLECT
                                        (GET.VALUE THISUNIT ATT.VALUE '
                                          VALUE 'OWN))))))
                                METHOD
                                (METHOD)))
                                (())
INTERMEDIATE VARIABLES
("HOLT" "27-Jan-1987 11:54:39" "HOLT" "10-Mar-1987 8:09:06")
(VARIABLES)
((CLASSES GENERICUNITS))
NIL
((ADEQUATE ENVIRONMENT
  NIL
  NIL
  #[-1 1]
  NIL
  ((COMMENT ("Adequacy of space, money and equipment to perform work")))
  (CARDINALITY MAX (1))))
(COHESIVE NIL NIL NIL NIL ((COMMENT ("Group cooperation and friendliness ")))
)
(EFFECTIVE PARTICIPATION
  NIL
  NIL
  #[-1 1]
  NIL
  ((COMMENT ("Participation in decisions and policy about job related function
s ")))
  (CARDINALITY MAX (1)))
(EXPECTATION OF REWARDS

```



```

NIL
NIL
  (#[ -1 1])
NIL
  ((CARDINALITY MAX (1)) (COMMENT "Expectation of receiving rewards for good w
ork.")))
  (EXTRINSIC REWARD
    NIL
    NIL
    (#[ -1 1])
    NIL
    ((COMMENT
      ("Extrinsic consequences of effective performance (outward signs of reward
). Secrist, McNee and Paden 1983."))
      (CARDINALITY MAX (1))))
  (GROWTH DEVELOP
    NIL
    NIL
    (#[ -1 1])
    NIL
    ((COMMENT ("Growth and development coming from work. Hackman Oldham, 1979.
"))
      (CARDINALITY MAX (1))))
  (IMPORTANCE OF REWARDS
    NIL
    NIL
    (#[ -1 1])
    NIL
    ((CARDINALITY MAX (1)) (COMMENT "The value of rewards to individual ")))
  (INFLUENCE ENVIRONMENT
    NIL
    NIL
    (#[ -1 1])
    NIL
    ((COMMENT ("Ability to influence the use of space, money and equipment on jo
b ")))
      (CARDINALITY MAX (1))))
  (INTRINSIC REWARD
    NIL
    NIL
    (#[ -1 1])
    NIL
    ((COMMENT
      ("Intrinsic consequences of effective performance (inward, internal typ
e rewards) Secrist, McNee and Paden 1983 ")))
      (CARDINALITY MAX (1))))
  (JOB CHALLENGE
    NIL
    NIL
    (#[ -1 1])
    NIL
    ((CARDINALITY MAX (1)) (COMMENT "The extent of challenge from
the job ")))
  (OVERALL CLIMATE
    NIL
    NIL
    (#[ -1 1])
    NIL
    ((COMMENT "This is the average of all climate variables")))
  (PERSONAL REL COMPETENCE
    NIL
    NIL
    (#[ -1 1])
    NIL
    ((COMMENT
      ("Measure SUPERVISOR's personal relations competence as seen by the employ
ee Secrist, McNee and Paden 1983 ")))
      (CARDINALITY MAX (1))))
  (ROLE CONFLICT

```

```

NIL
NIL
#[-1 1]
NIL
((COMMENT
  ("The conflict between expectations. Also conflict between expectations a
nd personal values."))
  (CARDINALITY.MAX (1))))
(SATISFACTION.WITH.GROUP
NIL
NIL
#[-1 1]
NIL
((COMMENT ("Group happiness and satisfaction. Secrist, McNee and Paden 1983.
"))
  (CARDINALITY.MAX (1))))
(SKILL.VARIETY.HO
NIL
NIL
#[-1 1]
NIL
((COMMENT ("Effective use of skills. Hackman and Oldham 1979.")) (CARDINALIT
Y.MAX (1))))
(TASK.COMPETENCE
NIL
NIL
#[-1 1]
NIL
((COMMENT
  ("Measure of SUPERVISORS's task competence as viewed by the employee. Sec
rist, McNee and Paden 1983 "))
  (CARDINALITY.MAX (1))))
(TEAMWORK
NIL
NIL
#[-1 1]
NIL
((COMMENT ("Feeling of working together in cooperation Secrist, McNee Pade
n 1983 "))
  (CARDINALITY.MAX (1))))
((ADEQUATE.ENVIRONMENT.MEMBERS (APPROPRIATE.PLACE AVAIL.MONEY
CORRECT.EQUIP
ADEQUATE.WORK.SPACE
ADEQUATE.MONEY
ENOUGH.EQUIPMENT))
(EFFECTIVE.PARTICIPATION.MEMBERS (PARTICIPATION.DECISIONS PARTICIPATION POLIC
Y))
(EXPECTATION.OF.REWARDS.MEMBERS (ADVANCEMENT RESPONSIBILITY
PROMOTION
PERFORMANCE RATING
SELF CONTROL))
(EXTRINSIC.REWARD.MEMBERS (INFLUENCE IMPRESSIVE.WORK
PERFORMANCE RATING
COMPLIMENTS
PROMOTION
COMPETENT
PAY TIME
JOB SECURITY
LESS SUPERVISION
FEEDBACK
GROUP FEEDBACK))
(GROWTH.DEVELOP.MEMBERS (GROWTH PERSONAL ACCOMPLISHMENT
ENJOY CHALLENGE
INDEPENDENT THOUGHT
STIMULATING.WORK))
(IMPORTANCE.OF.REWARDS.MEMBERS (NEED FOR ADVANCEMENT NEED FOR RESPON
NEED FOR PROMOTION

```

(INFLUENCE ENVIRONMENT MEMBERS (FLEXABLE SURROUNDINGS
 NEED FOR PERFORMANCE
 NEED FOR SELF CONTROL))
 INFLUENCE SPENDING
 EQUIPMENT USE
 ADJUSTABLE SURROUNDINGS
 ADDITIONAL MONEY
 ADDITIONAL EQUIPMENT))
 (INTRINSIC REWARD MEMBERS (CHALLENGING WORK RESPONSIBILITY
 ADVANCEMENT
 INVOLVEMENT
 PROMOTION
 DIFFICULT WORK
 VOLUME WORK
 SELF CONTROL))
 (JOB CHALLENGE MEMBERS (ENJOY CHALLENGE INDEPENDENT THOUGHT
 STIMULATING WORK
 DIFFICULT WORK
 ABILITY TO DO WORK))
 (OVERALL CLIMATE MEMBERS (COMM EFFECTIVENESS IND ORG CONTROL
 INTERPERSONAL REL
 PHYSICAL ENVIR
 REWARD SYS
 STANDARDS GOALS))
 (PERSONAL REL COMPETENCE MEMBERS (SUP COOPERATIVE SUP SUPPORTIVE
 SUP ENCOURAGING
 SUP HELPFUL
 SUP FAIR
 SUP CONSIDERATE
 SUP APPRECIATIVE
 SUP ACCEPTANCE))
 (ROLE CONFLICT MEMBERS (CONFUSED PLANNING UNCLEAR RESPONDS CONFLICT DEMANDS))
 (SATISFACTION WITH GROUP MEMBERS (GROUP PLEASURE ENJOYMENT
 DESIRE CHANGE
 COMPLAINTS
 DISSATISFACTION
 MANAGEMENT CONCERN
 CARE OF PEOPLE))
 (SKILL VARIETY HO MEMBERS (SKILL VARIETY REPETITIVE
 TASK SIGNIFICANCE
 BREADTH SIGNIFICANCE
 MEANINGFUL WORK
 TRIVIAL WORK
 TASK IDENTITY))
 (TASK COMPETENCE MEMBERS (SUP EFFECTIVE SUP PRODUCTIVE
 SUP EFFICIENT
 SUP CONVINCING
 SUP LEADER
 SUP CONFIDENT
 SUP IMAGINATIVE
 SUP DECISIVE))
 (TEAMWORK MEMBERS (QUARREL TENSION BELONGING UNCOOPERATIVE GET ALONG CARE OF
 PEOPLE)))

APPENDIX 15
COMPUTER LISTING OF ORGANIZATIONS

This appendix lists the LISP computer code representing the frames which contribute to the class of individuals. The member slots of ORGANIZATIONS are inherited from other frames listed.

The form for a frame or unit is:

```
(Unit name  
  (Creation and modification data)  
  Superclasses list  
  Member of list  
  Comment  
  Member slot list  
  Own slot list)
```

The form for a slot is:

```
(Slot name  
  Local value or program  
  Inheritance role  
  Value class  
  Default value list  
  Facet list or comment)
```

The form for a facet list is:

```
((Facet name  
  Facet local value  
  Facet role) ...)
```

```

(ORGANIZATIONS
  ("HOLT" "27-Jan-1987 11:57:36" "HOLT" "3-Mar-1987 14:41:22")
  (ORG PERFORMANCE CALC ORG PERFORMANCE MEASURES
    ORG CLIMATE VAR CALC
    CLIMATE VARIABLES
    ORGANIZATIONAL ELEMENTS)
  ((CLASSES GENERICUNITS))
  NIL
  ()
  ((ORDER TO EVALUATE
    (MASONS CARPENTERS BEST TEAM PLUMBERS METAL SHOP SUPERINTENDENT FREE INDIVID
    UALS)
    NIL
    (ORGANIZATIONS)
    NIL
    ((COMMENT
      "This slot contains the order in which to calculate the organizational cl
      imate and performance. It makes sure that subordinate organizations are evaluate
      d first so their values can be correctly calculated."))))))

(ORG PERFORMANCE CALC
  ("HOLT" "2-Feb-1987 18:28:20" "HOLT" "10-Mar-1987 16:46:42")
  (PERFORMANCE CALC)
  ((CLASSES GENERICUNITS))
  NIL
  ((ACHIEVEMENT CALC
    (LAMBDA (THISUNIT)
      (PUT VALUE THISUNIT
        'ACHIEVEMENT
        (AVERAGE OF (LIST (AVERAGE OF (LOOP FOR
          PERSONS
          IN
          (GET VALUES THISUNIT
            'MEMBERS OF ORG
            'VALUE
            'OWN)
          COLLECT
          (GET VALUES PERSONS
            'ACHIEVEMENT
            'VALUE
            'OWN))))
        (LOOP FOR
          SUBORGS
          IN
          (GET VALUES THISUNIT
            'SUBORDINATE ORGS
            'VALUE
            'OWN)
          COLLECT
          (GET VALUE SUBORGS 'ACHIEVEMENT 'VALUE
            'OWN))))))
    METHOD
    METHOD)
  (EFFECTIVENESS CALC
    (LAMBDA (THISUNIT)
      (PUT VALUE THISUNIT
        'EFFECTIVENESS
        (AVERAGE OF (LIST (AVERAGE OF (LOOP FOR
          PERSONS
          IN
          (GET VALUES THISUNIT
            'MEMBERS OF ORG
            'VALUE
            'OWN)
          COLLECT
          (GET VALUES PERSONS
            'EFFECTIVENESS

```

```

'VALUE
'OWN)))
      (LOOP FOR
        SUBORGS
        IN
        (GET VALUES THISUNIT
          'SUBORDINATE.ORGs
          'VALUE
          'OWN)
        COLLECT
        (GET VALUE SUBORGS 'EFFECTIVENESS 'VALU
E 'OWN)))))
      METHOD
      METHOD)
      (EFFICIENCY.CALC
        (LAMBDA (THISUNIT)
          (PUT VALUE THISUNIT
            'EFFICIENCY
            (AVERAGE.OF (LIST (AVERAGE.OF (LOOP FOR
              PERSONS
              IN
              (GET VALUES THISUNIT
                'MEMBERS OF ORG
                'VALUE
                'OWN)
              COLLECT
              (GET VALUES PERSONS
                'EFFICIENCY
                'VALUE
                'OWN))))
            (LOOP FOR
              SUBORGS
              IN
              (GET VALUES THISUNIT
                'SUBORDINATE.ORGs
                'VALUE
                'OWN)
              COLLECT
              (GET VALUE SUBORGS 'EFFICIENCY 'VALUE '
OWN)))))
      METHOD
      METHOD)
      (EXCELLENCE.CALC
        (LAMBDA (THISUNIT)
          (PUT VALUE THISUNIT
            'EXCELLENCE
            (AVERAGE.OF (LIST (AVERAGE.OF (LOOP FOR
              PERSONS
              IN
              (GET VALUES THISUNIT
                'MEMBERS OF ORG
                'VALUE
                'OWN)
              COLLECT
              (GET VALUES PERSONS
                'EXCELLENCE
                'VALUE
                'OWN)))
            (LOOP FOR
              SUBORGS
              IN
              (GET VALUES THISUNIT
                'SUBORDINATE.ORGs
                'VALUE
                'OWN)
              COLLECT
              (GET VALUE SUBORGS 'EXCELLENCE 'VALUE

```

```

OWN))))))
  METHOD
  METHOD)
  (JOB MOTIVATION CALC
  (LAMBDA (THISUNIT)
    (PUT VALUE THISUNIT
      'JOB MOTIVATION
      (AVERAGE OF (LIST (AVERAGE OF (LOOP FOR
        PERSONS
        IN
        (GET VALUES THISUNIT
          'MEMBERS OF ORG
          'VALUE
          'OWN)
        COLLECT
        (GET VALUES PERSONS
          'JOB MOTIVATION
          'VALUE
          'OWN)))
      (LOOP FOR
        SUBORGS
        IN
        (GET VALUES THISUNIT
          'SUBORDINATE ORGS
          'VALUE
          'OWN)
        COLLECT
        (GET VALUE SUBORGS 'JOB MOTIVATION 'VAL
UE 'OWN))))))
  METHOD
  METHOD,
  (JOB SATISFACTION CALC
  (LAMBDA (THISUNIT)
    (PUT VALUE THISUNIT
      'JOB SATISFACTION
      (AVERAGE OF (LIST (AVERAGE OF (LOOP FOR
        PERSONS
        IN
        (GET VALUES THISUNIT
          'MEMBERS OF ORG
          'VALUE
          'OWN)
        COLLECT
        (GET VALUES PERSONS
          'JOB SATISFACTI
          'VALUE
          'OWN)))
      (LOOP FOR
        SUBORGS
        IN
        (GET VALUES THISUNIT
          'SUBORDINATE ORGS
          'VALUE
          'OWN)
        COLLECT
        (GET VALUE SUBORGS 'JOB SATISFACTION 'V
ALUE 'OWN))))))
  METHOD
  METHOD)
  (NEED FULFILLMENT CALC
  (LAMBDA (THISUNIT)
    (PUT VALUE THISUNIT
      'NEED FULFILLMENT
      (AVERAGE OF (LIST (AVERAGE OF (LOOP FOR
        PERSONS
        IN

```


ON

```
'VALUE
'OWN)))
```

```
(LOOP FOR
SUBORGS
IN
(GET.VALUES THISUNIT
'SUBORDINATE ORGS
'VALUE
'OWN)

COLLECT
(GET.VALUE SUBORGS 'SELF REALIZATION 'V
```

ALUE 'OWN))))))

```
METHOD
METHOD)
```

(Z.OVERALL.PERFORM.CALC

(LAMBDA (THISUNIT)

(PUT.VALUE THISUNIT

'OVERALL.PERFORMANCE

(AVERAGE.OF (LIST (AVERAGE.OF (LOOP FOR

PERFORMANCE.MEASURE

IN

(GET.VALUES THISUNIT

'PERFORMANCE WE

IGHTS

```
'VALUE
'OWN)
```

COLLECT

(GET.VALUE THISUNIT

PERFORMANCE.MEAS

URE

```
'VALUE
'OWN)))
```

```
(LOOP FOR
SUBORGS
IN
(GET.VALUES THISUNIT
'SUBORDINATE ORGS
'VALUE
'OWN)

COLLECT
(GET.VALUE SUBORGS
'OVERALL.PERFORMANCE
'VALUE
'OWN))))))
```

METHOD

(METHOD)

NIL

((COMMENT

```
("This calculates the overall performance of the organization based upon th
e performance measures and thier relative importance to overall performance ")))
```

```
)
()
```

(ORG PERFORMANCE MEASURES

("HOLT" "27-Jan-1987 11.55.33" "HOLT" "9-Mar-1987 14 22.04")

(PERFORMANCE)

(CLASSES GENERICUNITS))

NIL

[ACHIEVEMENT NIL NIL #[-1 1]]

[EFFECTIVENESS NIL NIL #[-1 1]]

[EFFICIENCY NIL NIL #[-1 1]]

[EXCELLENCE NIL NIL #[-1 1]]

[JOB MOTIVATION NIL NIL #[-1 1]] NIL ((COMMENT "Hackman and Oldham ")))

[JOB SATISFACTION NIL NIL #[-1 1]]

[NEED FULFILLMENT NIL NIL #[-1 1]]

[REALIZATION OF POTENTIAL NIL NIL #[-1 1]]


```

(INTERPERSONAL REL CALC
(LAMBDA (THISUNIT)
(PUT VALUE THISUNIT
'INTERPERSONAL REL
(AVERAGE OF (LIST (AVERAGE OF (LOOP FOR
PERSONS
IN
(GET VALUES THISUNIT
'MEMBERS OF ORG
'VALUE
'OWN)
COLLECT
(GET VALUE PERSONS
'INTERPERSONAL R
'VALUE
'OWN))))))
EL
(LIST (AVERAGE OF (LIST (AVERAGE OF (LOOP FOR
SUBORGS
IN
(GET VALUES THISUNIT
'SUBORDINATE ORGS
'VALUE
'OWN)
COLLECT
(GET VALUE SUBORGS
'INTERPERSONAL REL
'VALUE
'OWN))))))
METHOD
METHOD)
(JOB EVALUATION CALC
(LAMBDA (THISUNIT)
(PUT VALUE THISUNIT
'JOB EVALUATION
(AVERAGE OF (LIST (AVERAGE OF (LOOP FOR
PERSONS
IN
(GET VALUES THISUNIT
'MEMBERS OF ORG
'VALUE
'OWN)
COLLECT
(GET VALUE PERSONS
'JOB EVALUATION
'VALUE
'OWN))))))
(LIST (AVERAGE OF (LIST (AVERAGE OF (LOOP FOR
SUBORGS
IN
(GET VALUES THISUNIT
'SUBORDINATE ORGS
'VALUE
'OWN)
COLLECT
(GET VALUE SUBORGS 'JOB EVALUATION 'VAL
UE 'OWN))))))
METHOD
METHOD)
(LEADER SUPER CALC
(LAMBDA (THISUNIT)
(PUT VALUE THISUNIT
'LEADER SUPER
(AVERAGE OF (LIST (AVERAGE OF (LOOP FOR
PERSONS
IN
(GET VALUES THISUNIT

```

```

                                'MEMBERS OF ORG
                                'VALUE
                                'OWN)
                                COLLECT
                                (GET VALUE PERSONS
                                'LEADER SUPER
                                'VALUE
                                'OWN)))
                                (LOOP FOR
                                SUBORGS
                                IN
                                (GET VALUES THISUNIT
                                'SUBORDINATE. ORGS
                                'VALUE
                                'OWN)
                                COLLECT
                                (GET VALUE SUBORGS 'LEADER SUPER 'VALUE
                                'OWN))))))
                                METHOD
                                METHOD)
                                (OVERALL CLIMATE CALC
                                (LAMBDA (THISUNIT)
                                (PUT VALUE THISUNIT
                                'OVERALL CLIMATE
                                (AVERAGE OF (LIST (AVERAGE OF (LOOP FOR
                                PERSONS
                                IN
                                (GET VALUES THISUNIT
                                'MEMBERS OF ORG
                                'VALUE
                                'OWN)
                                COLLECT
                                (GET VALUE PERSONS
                                'OVERALL CLIMATE
                                'VALUE
                                'OWN))))
                                (LOOP FOR
                                SUBORGS
                                IN
                                (GET VALUES THISUNIT
                                'SUBORDINATE. ORGS
                                'VALUE
                                'OWN)
                                COLLECT
                                (GET VALUE SUBORGS 'OVERALL CLIMATE 'VA
                                'OWN))))))
                                METHOD
                                METHOD)
                                (PERSONAL NEEDS CALC
                                (LAMBDA (THISUNIT)
                                (PUT VALUE THISUNIT
                                'PERSONAL NEEDS
                                (AVERAGE OF (LIST (AVERAGE OF (LOOP FOR
                                PERSONS
                                IN
                                (GET VALUES THISUNIT
                                'MEMBERS OF ORG
                                'VALUE
                                'OWN)
                                COLLECT
                                (GET VALUE PERSONS
                                'PERSONAL NEEDS
                                'VALUE
                                'OWN))))
                                (LOOP FOR
                                SUBORGS
                                IN

```

```

                                (GET VALUES THISUNIT
                                  'SUBORDINATE ORGS
                                  'VALUE
                                  'OWN)
                                COLLECT
                                (GET VALUE SUBORGS 'PERSONAL NEEDS 'VAL

UE 'OWN))))))
  METHOD
  METHOD)
  (PHYSICAL ENVIR CALC
  (LAMBDA (THISUNIT)
    (PUT VALUE THISUNIT
      'PHYSICAL ENVIR
      (AVERAGE OF (LIST (AVERAGE OF (LOOP FOR
                                PERSONS
                                IN
                                (GET VALUES THISUNIT
                                  'MEMBERS OF ORG
                                  'VALUE
                                  'OWN)
                                COLLECT
                                (GET VALUE PERSONS
                                  'PHYSICAL ENVIR
                                  'VALUE
                                  'OWN)))
                                (LOOP FOR
                                SUBORGS
                                IN
                                (GET VALUES THISUNIT
                                  'SUBORDINATE ORGS
                                  'VALUE
                                  'OWN)
                                COLLECT
                                (GET VALUE SUBORGS 'PHYSICAL ENVIR 'VAL

UE 'OWN))))))
  METHOD
  METHOD)
  (REWARD SYS CALC
  (LAMBDA (THISUNIT)
    (PUT VALUE THISUNIT
      'REWARD SYS
      (AVERAGE OF (LIST (AVERAGE OF (LOOP FOR
                                PERSONS
                                IN
                                (GET VALUES THISUNIT
                                  'MEMBERS OF ORG
                                  'VALUE
                                  'OWN)
                                COLLECT
                                (GET VALUE PERSONS
                                  'REWARD SYS
                                  'VALUE
                                  'OWN)))
                                (LOOP FOR
                                SUBORGS
                                IN
                                (GET VALUES THISUNIT
                                  'SUBORDINATE ORGS
                                  'VALUE
                                  'OWN)
                                COLLECT
                                (GET VALUE SUBORGS 'REWARD SYS 'VALUE

OWN))))))
  METHOD
  METHOD)
  (STANDARDS GOALS CALC
  (LAMBDA (THISUNIT)

```

```

(PUT VALUE THISUNIT
  'STANDARDS GOALS
  (AVERAGE OF (LIST (AVERAGE OF (LOOP FOR
    PERSONS
    IN
    (GET VALUES THISUNIT
      'MEMBERS OF ORG
      'VALUE
      'OWN)
    COLLECT
    (GET VALUE PERSONS
      'STANDARDS GOALS
      'VALUE
      'OWN)))
  (LOOP FOR
    SUBORGS
    IN
    (GET VALUES THISUNIT
      'SUBORDINATE ORGS
      'VALUE
      'OWN)
    COLLECT
    (GET VALUE SUBORGS 'STANDARDS GOALS 'VA
LUE 'OWN))))))
  METHOD
  METHOD)
(STRESS.CALC
  (LAMBDA (THISUNIT)
    (PUT VALUE THISUNIT
      'STRESS
      (AVERAGE OF (LIST (AVERAGE OF (LOOP FOR
        PERSONS
        IN
        (GET VALUES THISUNIT
          'MEMBERS OF ORG
          'VALUE
          'OWN)
        COLLECT
        (GET VALUE PERSONS
          'STRESS
          'VALUE
          'OWN)))
      (LOOP FOR
        SUBORGS
        IN
        (GET VALUES THISUNIT
          'SUBORDINATE ORGS
          'VALUE
          'OWN)
        COLLECT
        (GET VALUE SUBORGS 'STRESS 'VALUE 'OWN)
      ))))
    METHOD
    METHOD))
  ))
(CLIMATE VARIABLES
  "HOLT" "27-Jan-1987 11 55 43" "HOLT" "3-Feb-1987 23 07 53")
(VARIABLES)
(CLASSES GENERICUNITS))
NIL
(COMM EFFECTIVENESS NIL NIL #[-1 1] NIL ((CARDINALITY MAX (1)) (COMMENT "Secr
st 1983"))
(FIND ORG CONTROL NIL NIL #[-1 1] NIL ((CARDINALITY MAX (1)) (COMMENT "Secr st
1983"))
(INTERPERSONAL REL NIL NIL #[-1 1] NIL ((CARDINALITY MAX (1)) (COMMENT "Secr
st 1983")))

```

```

(JOB EVALUATION NIL
  NIL
  #[-1 1]
  NIL
  ((CARDINALITY MAX (1)) (COMMENT "Hackman and Oldham 1980")))
(LEADER SUPER NIL NIL #[-1 1] NIL ((CARDINALITY MAX (1)) (COMMENT "Secrist 19
83"))))
(PERSONAL NEEDS NIL NIL #[-1 1] NIL ((CARDINALITY MAX (1)) (COMMENT "Secrist
1983"))))
(PHYSICAL ENVIR NIL NIL #[-1 1] NIL ((CARDINALITY MAX (1)) (COMMENT "Secrist
1983"))))
(REWARD SYS NIL NIL #[-1 1] NIL ((CARDINALITY MAX (1)) (COMMENT "Secrist 1983
"))))
(STANDARDS GOALS NIL NIL #[-1 1] NIL ((CARDINALITY MAX (1)) (COMMENT "Secrist
1983"))))
(STRESS NIL NIL #[-1 1] NIL ((CARDINALITY MAX (1)) (COMMENT "Secrist 1983"))))
)
())

(ORGANIZATIONAL ELEMENTS
  ("HOLT" "27-Jan-1987 11:56:22" "HOLT" "21-Apr-1987 14:17:05")
  ((ENTITIES GENERICUNITS))
  ((CLASSES GENERICUNITS))
  NIL
  ((MEMBERS OF ORG NIL NIL (INDIVIDUALS) NIL NIL)
  (OVERALL CLIMATE NIL NIL (#[-1 1]) NIL ((CARDINALITY MAX (1)))))
  (OVERALL PERFORMANCE
    NIL
    NIL
    (#[-1 1])
    NIL
    ((CARDINALITY MAX (1))
    (COMMENT "The bottom line of all performance measures See performance wei
ghts"))))
  (PERFORMANCE WEIGHTS
    (ACHIEVEMENT EFFECTIVENESS
      EFFICIENCY
      EXCELLENCE
      JOB MOTIVATION
      JOB SATISFACTION
      NEED FULFILLMENT
      REALIZATION OF POTENTIAL
      SELF REALIZATION)

    NIL
    NIL
    NIL
    (COMMENT
      "This weights the relative importance of the various performance measures
in determining OVERALL performance"))
    (SUBORDINATE ORG WEIGHT
      NIL
      NIL
      NIL
      (ORGANIZATIONS)
      NIL
      (COMMENT
        "This weights the relative importance of this organizations subunits in de
termining the performance of this unit"))
    (SUBORDINATE ORGS NIL NIL (ORGANIZATIONS) NIL NIL))

```

APPENDIX 17 HYPOTHETICAL SITUATIONS

The following hypothetical situations were used to validate the expert system. Managers were asked to consider each situation and indicate how the situation would affect their organization for each of the performance measures on the following scale:

	Great Decrease	Slight Decrease	No Change	Slight Improvement	Great Improvement
Achievement (Hard work, Productive)	1	2	3	4	5
Effectiveness (Doing right job)	1	2	3	4	5
Efficiency (Avoid wasted effort)	1	2	3	4	5
Excellence (Doing quality work)	1	2	3	4	5
Realization of Potential (Motivated, Best possible)	1	2	3	4	5
Job Satisfaction (Job interest, Successful)	1	2	3	4	5
Need Fulfillment (High morale, Meaningful work)	1	2	3	4	5
Self-realization (Self-esteem, Competent)	1	2	3	4	5

(improve) a little, increase a lot, decrease (worsen) a little or decrease a lot. The attitudes in each category follow each situation.

Situation 1.

You have received an improved method of communicating with your employees. (This could be a new intercom, new handheld radios or some other method appropriate for your work.) It is now easier for you to contact them and for them to contact you.

<u>Decrease a Lot</u>	<u>Decrease a Little</u>	<u>Increase a Little</u>	<u>Increase a Lot</u>
<u>INFORMATION.</u> <u>AVAIL</u> (a stress variable)	<u>BELIEVABLE.COMM</u> <u>LEVEL.SUPERVISOR</u> <u>NEED.FOR.FEEDBACK</u> <u>NEED.FOR.</u> <u>INFLUENCE</u> <u>NEED.FOR.</u> <u>INVOLVEMENT</u>	<u>ACCURATE.COMM</u> <u>INFLUENCE.OTHERS</u> <u>SATISFIED.COMM</u> <u>CORRESP.TIMELY</u> <u>BELONGING</u> <u>PARTICIPATION.</u> <u>DECISIONS</u> <u>GROUP.COORD</u> <u>MEANINGFUL.WORK</u> <u>INFLUENCE</u> <u>INVOLVEMENT</u> <u>FEEDBACK</u> <u>CORRECT.EQUIP</u> <u>ENOUGH.EQUIPMENT</u>	<u>ANSWERS.AVAIL</u> <u>AVAIL.TIMO</u> <u>INFO.AVAIL</u>

Situation 2.

You received new directives from superiors which dictate how your work group will be organized, how your work will be done and who will do the work. The stringent directives are understandable and have very little flexibility.

<u>Decrease a Lot</u>	<u>Decrease a Little</u>	<u>Increase a Little</u>	<u>Increase a Lot</u>
<u>PARTICIPATION.</u>	BELONGING	NEED.FOR.	NEED.FOR.LESS.
<u>POLICY</u>	<u>PARTICIPATION.</u>	<u>INFLUENCE</u>	<u>SUPERVISION</u>
<u>RESTRICTIONS</u>	<u>DECISIONS</u>	NEED.FOR.	NEED.FOR.SELF.
<u>LESS.</u>	<u>MANAGEMENT.</u>	<u>INVOLVEMENT</u>	<u>CONTROL</u>
<u>SUPERVISION</u>	<u>RESPONS</u>	CONFUSED.	LACK.OF.
<u>SELF.CONTROL</u>	PERSONAL	EXPECTATIONS	<u>INFLUENCE</u>
	JUDGEMENT	<u>UNNECESSARY.ATTEN</u>	
	<u>AGREEABLE.GOALS</u>		
	TRUST		
	COMPLAINTS		
	DESIRE.CHANGE		
	DISSATISFACTION		
	CONFUSED.PLANNING		
	<u>UNCLEAR.RESPONS</u>		
	TENSION		
	<u>INDEPENDENT.</u>		
	<u>THOUGHT</u>		
	INFLUENCE		
	<u>INVOLVEMENT</u>		

Situation 3.

You are directed to start a new policy where each employee picks the work he wants to do and sets his own work schedule. He will decide when he will finish the work.

<u>Decrease a Lot</u>	<u>Decrease a Little</u>	<u>Increase a Little</u>	<u>Increase a Lot</u>
NEED.FOR.SELF.	GET.ALONG	LEVEL.SUPERVISION	BELONGING
CONTROL	GROUP.COORD	MANAGEMENT.	FAIRNESS
APPEAR.BUSY	NEED.FOR.	RESPONS	PARTICIPATION.
CONFLICT.	DIFFICULT.WORK	MANAGEMENT.	DECISIONS
VALUES	NEED.FOR.LESS.	SUPPORT	PERSONAL.
LACK.OF.	SUPERVISION	OPEN.EXPRESSION	JUDGMENT
INFLUENCE	NEED.FOR.RESPONS	COMPLAINTS	INDEPENDENT.
NEGLECTED.WORK	AGREEABLE.GOALS	DESIRE.CHANGE	THOUGHT
	CONFUSED.	PARTICIPATION.	OVERLOADED
	EXPECTATIONS	POLICY	
	NEEDED.WORK	RESTRICTIONS	
	PRESSURE	TRUST	
		CARE.OF.PEOPLE	
		SELF.CONTROL	
		UNCLEAR.RESPONS	

Situation 4.

Two of your employees have a major disagreement. The other employees in your group have strong opinions about it. They all become very uncomfortable whenever the subject is brought up.

<u>Decrease a Lot</u>	<u>Decrease a Little</u>	<u>Increase a Little</u>	<u>Increase a Lot</u>
<u>FREEDOM.OF.</u>	<u>ACCURATE.COMM</u>		
<u>SPEECH</u>	<u>AVAIL.INFO</u>		
<u>SATISFIED.COMM</u>	<u>BELIEVABLE.COMM</u>		
<u>ENJOYMENT</u>	<u>OPEN.</u>		
<u>QUARREL</u>	<u>COMMUNICATIONS</u>		
<u>TENSION</u>	<u>OPEN.EXPRESSION</u>		
	<u>COMPLAINTS</u>		
	<u>DESIRE.CHANGE</u>		
	<u>DISSATISFACTION</u>		
	<u>GET.ALONG</u>		
	<u>GROUP.COORD</u>		
	<u>GROUP.PLEASURE</u>		
	<u>UNCOOPERATIVE</u>		

Situation 5.

You are told to have your employees meet for one hour of free time each week. They can use this time to play cards, discuss personal interests, get to know each other or participate in any other social activity.

<u>Decrease a Lot</u>	<u>Decrease a Little</u>	<u>Increase a Little</u>	<u>Increase a Lot</u>
<u>SUP. EFFICIENT</u>	COMPLAINTS	ACCURATE COMM	NEED FOR
<u>PAY. TIME</u>	MEANINGFUL WORK	ANSWERS. AVAIL	CHALLENGE
	ENJOY CHALLENGE	CONVINCING	CONFLICT
	PERSONAL	FREEDOM OF SPEECH	DEMANDS
	ACCOMPLISHMENT	INFLUENCE OTHERS	USE OF
	STIMULATING WORK	OPEN	RESOURCES
	TRIVIAL WORK	COMMUNICATIONS	
	NEED FOR	SATISFIED COMM	
	INFLUENCE	BELONGING	
	NEED FOR	MANAGEMENT	
	INVOLVEMENT	RESPONS	
	NEED FOR PAY. TIME	CARE OF PEOPLE	
	NEED FOR SELF	ENJOYMENT	
	CONTROL	GROUP COORD	
	INFLUENCE	GROUP PLEASURE	
	INVOLVEMENT	TENSION	
	NEGLECTED WORK	UNCOOPERATIVE	
	APPEAR BUSY	NEED FOR	
	DIFFICULT WORK	DIFFICULT WORK	
		NEED FOR VOLUME	
		ADJUSTABLE	
		SURROUNDINGS	
		FEEDBACK	
		GROUP FEEDBACK	
		OVERLOADED	

Situation 5.

You receive a new supervisor who really knows the work your group does. He makes good decisions and handles difficult problems well. He is well liked by all your employees.

<u>Decrease a Lot</u>	<u>Decrease a Little</u>	<u>Increase a Little</u>	<u>Increase a Lot</u>
USE.OF. RESOURCES (a stress variable)	CONFLICT.DEMANDS CONFLICT. ASSIGNMENT	ACCURATE.COMM BELIEVABLE.COMM FAIRNESS MANAGEMENT. SUPPORT ENJOYMENT GROUP.COORD MANAGEMENT. CONCERN SUP.APPRECIATIVE SUP.CONFIDENT SUP.CONVINCING SUP.FAIR NEED.FOR. IMPRESSION NEED.FOR. INFLUENCE DIFFICULT.WORK INFLUENCE IMPRESSIVE.WORK PERFORMANCE. RATING RESPONSIBILITY NEEDED.WORK NEGLECTED.WORK OVERLOADED PRESSURE	SUP.DECISIVE SUP.EFFECTIVE SUP.LEADER COMPETENT COMPLEMENTS AGREEABLE. GOALS CONFUSED. EXPECTATIONS

Situation 7.

Your organization receives a very large amount of laborious, uninteresting work. The work is not very important, but must still be done. The work is highly repetitive.

<u>Decrease a Lot</u>	<u>Decrease a Little</u>	<u>Increase a Little</u>	<u>Increase a Lot</u>
GROUP.PLEASURE	FAIRNESS	ABILITY.TO.DO.	
BREADTH.	MANAGEMENT.	WORK	
SIGNIFICANCE	RESPONS	KNOWLEDGE.OF.JOB	
REPETITIVE	PERSONAL.	CONFLICT.VALUES	
STIMULATING.	JUDGEMENT	USE.OF.RESOURCES	
WORK	COMPLAINTS		
NEED.FOR.	DESIRE.CHANGE		
VOLUME	ENJOY.CHALLENGE		
AGREEABLE.	INDEPENDENT.		
GOALS	THOUGHT		
DIFFICULT.WORK	MEANINGFUL.WORK		
GOAL.	TASK.		
ACHIEVEMENT	SIGNIFICANCE		
	SUP.EFFICIENT		
	SUP.IMAGINATIVE		
	SUP.PRODUCTIVE		
	CHALLENGING.WORK		
	DIFFICULT.WORK		
	INFLUENCE		
	INVOLVEMENT		
	PERFORMANCE.		
	RATING		
	NEEDED.WORK		
	NEGLECTED.WORK		
	OVERLOADED		
	UNCLEAR.RESPONS		

Situation 3.

A reorganization forces your work group to move to a different work location. The new location is not very well suited for your type of work. Several things prevent you or your group from improving the work area for some time.

<u>Decrease a Lot</u>	<u>Decrease a Little</u>	<u>Increase a Little</u>	<u>Increase a Lot</u>
<u>ADEQUATE.WORK.</u>	<u>ACCURATE.COMM</u>	<u>UNCOOPERATIVE</u>	
<u>SPACE</u>	<u>AVAIL.INFO</u>	<u>NEED.FOR.SELF.</u>	
<u>ADJUSTABLE.</u>	<u>INFO.AVAIL</u>	<u>CONTROL</u>	
<u>SURROUNDINGS</u>	<u>REPORTS.TIMELY</u>	<u>NEED.FOR.</u>	
<u>APPROPRIATE.</u>	<u>FAIRNESS</u>	<u>INFLUENCE</u>	
<u>PLACE</u>	<u>MANAGEMENT.</u>	<u>CONFLICT.</u>	
<u>FLEXIBLE.</u>	<u>RESPONS</u>	<u>ASSIGNMENT</u>	
<u>SURROUNDINGS</u>	<u>CARE.OF.PEOPLE</u>	<u>CONFLICT.DEMANDS</u>	
	<u>COMPLAINTS</u>	<u>CONFUSED.PLANNING</u>	
	<u>MANAGEMENT.</u>	<u>INFORMATION.AVAIL</u>	
	<u>CONCERN</u>	<u>LACK.OF.INFLUENCE</u>	
	<u>MEANINGFUL.WORK</u>	<u>USE.OF.RESOURCES</u>	
	<u>TRIVIAL.WORK</u>		

Situation 9.

You receive a new supervisor who wastes a lot of time. He has a hard time making decisions and is hard to get along with. Your employees question his ability.

<u>Decrease a Lot</u>	<u>Decrease a Little</u>	<u>Increase a Little</u>	<u>Increase a Lot</u>
SUP.DECISIVE	ACCURATE.COMM	NEED.FOR.FEEDBACK	
SUP.EFFECTIVE	BELIEVABLE.COMM	NEED.FOR.JOB.	
SUP.EFFICIENT	FREEDOM.OF.SPEECH	SECURITY	
SUP.PRODUCTIVE	OPEN.	NEED.FOR.SELF.	
	COMMUNICATIONS	CONTROL	
	SATISFIED.COMM	PRESSURE	
	FAIRNESS		
	MANAGEMENT.		
	RESPONS		
	OPEN.EXPRESSION		
	DESIRE.CHANGE		
	MANAGEMENT.		
	CONCERN		
	UNCOOPERATIVE		
	SUP.ACCEPTANCE		
	SUP.CONFIDENT		
	SUP.CONSIDERATE		
	SUP.ENCOURAGING		
	SUP.LEADER		
	SUP.SUPPORTIVE		
	AGREEABLE.GOALS		

Situation 10.

For some reason, people in your organization have stopped talking to each other. They do not share information about the job. It seems hard to get information from them. When they do talk, you can not always believe what they say.

<u>Decrease a Lot</u>	<u>Decrease a Little</u>	<u>Increase a Little</u>	<u>Increase a Lot</u>
<u>ANSWERS.AVAIL</u>	<u>SATISFIED.COMM</u>	<u>NEED.FOR.FEEDBACK</u>	
<u>AVAIL.INFO</u>	<u>OPEN.</u>		
<u>GROUP.PLEASURE</u>	<u>COMMUNICATIONS</u>		
<u>ACCURATE.COMM</u>	<u>BELONGING</u>		
<u>BELIEVABLE.</u>	<u>OPEN.EXPRESSION</u>		
<u>COMM</u>	<u>CARE.OF.PEOPLE</u>		
	<u>COMPLAINTS</u>		
	<u>DESIRE.CHANGE</u>		
	<u>DISSATISFACTION</u>		
	<u>ENJOYMENT</u>		
	<u>TENSION</u>		
	<u>UNCOOPERATIVE</u>		
	<u>SUP.APPRECIATIVE</u>		

Situation 11.

Your organization receives a new piece of equipment that was badly needed. The equipment could be office equipment, shop equipment, tools or a motor vehicle. You have control of the new equipment.

<u>Decrease a Lot</u>	<u>Decrease a Little</u>	<u>Increase a Little</u>	<u>Increase a Lot</u>
DESIRE.CHANGE NEED.FOR. INFLUENCE NEED.FOR.SELF. CONTROL NEGLECTED.WORK CONFLICT.DEMANDS		FAIRNESS MANAGEMENT. RESPONS CARE.OF.PEOPLE ENJOYMENT GROUP.PLEASURE MANAGEMENT. CONCERN BREADTH. SIGNIFICANCE MEANINGFUL.WORK TASK.SIGNIFICANCE SUP.EFFECTIVE SUP.PRODUCTIVE ADEQUATE.MONEY ABILITY.TO.DO. WORK NEEDED.WORK	ADDITIONAL. EQUIPMENT CORRECT.EQUIP ENOUGH. EQUIPMENT EQUIPMENT.USE

Situation 12.

A new supervisor arrives. He does not believe in giving out rewards. He does not like certificates of recognition, plaques or thank-you letters. He has stopped giving time off work and incentive pay as rewards.

<u>Decrease a Lot</u>	<u>Decrease a Little</u>	<u>Increase a Little</u>	<u>Increase a Lot</u>
SUP. <u>APPRECIATIVE</u>	ANSWERS.AVAIL <u>OPEN.</u>	CONFLICT.VALUES <u>USE.OF.RESOURCES</u>	NEED.FOR. <u>COMPETENCE</u>
SUP. <u>CONSIDERATE</u>	COMMUNICATIONS <u>MANAGEMENT.</u>		NEED.FOR. <u>COMPLEMENTS</u>
SUP. <u>COOPERATIVE</u>	RESPONS <u>MANAGEMENT.</u>		LACK.OF. <u>INFLUENCE</u>
	SUPPORT <u>CARE.OF.PEOPLE</u>		
	COMPLAINTS <u>MANAGEMENT.</u>		
	CONCERN <u>PERSONAL.</u>		
	ACCOMPLISHMENT <u>SUP.ENCOURAGING</u>		
	SUP.FAIR <u>SUP.SUPPORTIVE</u>		
	FEEDBACK <u>GROUP.FEEDBACK</u>		
	CONFUSED. <u>EXPECTATIONS</u>		
	COMPETENT <u>COMPLEMENTS</u>		
	IMPRESSIVE.WORK <u></u>		

Situation 13.

You are told to take a lot of time and to work with each of your employees and supervisors to develop a new work plan for your group. The work plan will outline the standards and goals for work in your area.

<u>Decrease a Lot</u>	<u>Decrease a Little</u>	<u>Increase a Little</u>	<u>Increase a Lot</u>
<u>RESTRICTIONS</u>	<u>UNCLEAR RESPONS</u>	<u>ACCURATE COMM</u>	<u>CONFUSED</u>
	<u>LEVEL SUPERVISION</u>	<u>AVAIL INFO</u>	<u>EXPECTATIONS</u>
	<u>PERSONAL</u>	<u>REPORTS TIMELY</u>	<u>NEEDED WORK</u>
	<u>JUDGEMENT</u>	<u>SATISFIED COMM</u>	<u>NEGLECTED WORK</u>
	<u>INDEPENDENT</u>	<u>BELONGING</u>	
	<u>THOUGHT</u>	<u>FAIRNESS</u>	
	<u>CONFLICT</u>	<u>MANAGEMENT</u>	
	<u>ASSIGNMENT</u>	<u>RESPONS</u>	
	<u>CONFLICT DEMANDS</u>	<u>PARTICIPATION</u>	
	<u>CONFUSED PLANNING</u>	<u>DECISIONS</u>	
	<u>COMPETENT</u>	<u>PARTICIPATION</u>	
	<u>COMPLIMENTS</u>	<u>POLICY</u>	
	<u>FEEDBACK</u>	<u>BREADTH</u>	
	<u>GROUP FEEDBACK</u>	<u>SIGNIFICANCE</u>	
		<u>ENJOY</u>	
		<u>CHALLENGE</u>	
		<u>TRIVIAL WORK</u>	
		<u>SUP ACCEPTANCE</u>	
		<u>SUP APPRECIATIVE</u>	
		<u>SUP COOPERATIVE</u>	
		<u>SUP SUPPORTIVE</u>	
		<u>ABILITY TO DO</u>	
		<u>WORK</u>	
		<u>KNOWLEDGE OF JOB</u>	
		<u>OVERLOADED</u>	
		<u>UNNECESSARY</u>	
		<u>ATTEN</u>	

Situation 14.

A new supervisor arrives. He starts making a lot of new policies about things that do not have anything to do with the work. It is not clear what is expected and you often get conflicting directives. At the same time, you're pressured to do more work and do it faster.

<u>Decrease a Lot</u>	<u>Decrease a Little</u>	<u>Increase a Little</u>	<u>Increase a Lot</u>
<u>CONFUSED.</u>	<u>OPEN.</u>	<u>NEED.FOR.</u>	<u>CONFLICT.</u>
<u>EXPECTATIONS</u>	<u>COMMUNICATIONS</u>	<u>INVOLVEMENT</u>	<u>ASSIGNMENT</u>
<u>OVERLOADED</u>	<u>SATISFIED.COMM</u>	<u>NEED.FOR.JOB.</u>	<u>CONFLICT.</u>
	<u>FAIRNESS</u>	<u>SECURITY</u>	<u>DEMANDS</u>
	<u>MANAGEMENT.</u>	<u>NEED.FOR.SELF.</u>	<u>PRESSURE</u>
	<u>RESPONS</u>	<u>CONTROL</u>	
	<u>PARTICIPATION.</u>	<u>VOLUME.WORK</u>	
	<u>POLICY</u>	<u>APPEAR.BUSY</u>	
	<u>TRUST</u>	<u>INFORMATION.AVAIL</u>	
	<u>CARE.OF.PEOPLE</u>		
	<u>COMPLAINTS</u>		
	<u>DISSATISFACTION</u>		
	<u>MANAGEMENT.</u>		
	<u>CONCERN</u>		
	<u>INDEPENDENT.</u>		
	<u>THOUGHT</u>		
	<u>SUP.ACCEPTANCE</u>		
	<u>SUP.APPRECIATIVE</u>		
	<u>SUP.COOPERATIVE</u>		
	<u>SUP.HELPFUL</u>		
	<u>COMPLIMENTS</u>		
	<u>AGREEABLE.GOALS</u>		
	<u>GOAL.ACHIEVEMENT</u>		
	<u>KNOWLEDGE.OF.JOB.</u>		

Situation 15.

Your organization is given a significant amount of money to use for recognizing good employees. The money can be used for plaques, certificates, time off, social events or cash awards. You have control of the money.

<u>Decrease a Lot</u>	<u>Decrease a Little</u>	<u>Increase a Little</u>	<u>Increase a Lot</u>
	NEED.FOR. COMPLEMENTS NEED.FOR.FEEDBACK NEED.FOR.PAY.TIME NEED.FOR.SELF. CONTROL USE.OF.RESOURCES	ACCURATE.COM ANSWERS.AVAIL MANAGEMENT. RESPONS MANAGEMENT. SUPPORT ENTOURNENT COMPLAINTS MANAGEMENT. CONCERN TASK.SIGNIFICANCE TRIVIAL.WORK SUP.APPRECIATIVE SUP.SUPPORTIVE ADEQUATE.MONEY ADDITIONAL.MONEY AGREEABLE.GOALS GOAL.ACHIEVEMENT APPEAR.BUSY CONFLICT.VALUES PRESSURE	COMPLIMENTS FEEDBACK GROUP.FEEDBACK PAY.TIME

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Situation 15.

Your organization is assigned a very important project that will receive a lot of attention from important people. The job is hard but within the capabilities of your employees. Almost every one of your employees will be involved on this highly visible work.

<u>Decrease a Lot</u>	<u>Decrease a Little</u>	<u>Increase a Little</u>	<u>Increase a Lot</u>
	SUP.COOPERATIVE	ACCURATE.COMM	
	SUP.ACCEPTANCE	AVAIL.INF	
	SUP.DECISIVE	INFLUENCE.OTHERS	
	NEED.FOR.	BELONGING	
	CHALLENGE	TRUST	
	NEED.FOR.	COMPLAINTS	
	COMPLIMENTS	DESIRE.CHANGE	
	NEED.FOR.	DISSATISFACTION	
	DIFFICULT.WORK	GROUP.COORD	
	NEED.FOR.PAY.TIME	UNCOOPERATIVE	
	INFORMATION.AVAIL	GROWTH	
	LACK.OF.INFLUENCE	MEANINGFUL.WORK	
	UNCLEAR.RESPONS	PERSONAL.	
		ACCOMPLISHMENT	
		TASK.IDENTITY	
		STIMULATING.WORK	
		TRIVIAL.WORK	
		SUP.SUPPORTIVE	
		ADDITIONAL.	
		EQUIPMENT	
		ADDITIONAL.MONEY	
		ADVANCEMENT	
		COMPETENT	
		COMPLIMENTS	
		FEEDBACK	
		GROUP.FEEDBACK	
		IMPRESSIVE.WORK	
		PERFORMANCE.	
		RATING	
		AGREEABLE.GOALS	
		CONFUSED.	
		EXPECTATIONS	
		GOAL.ACHIEVEMENT	
		PRESSURE	

Situation 17.

You are given a new assignment for your work group. This work is a little different than what your employees normally do. Because of time, you are forced to do the work right away. You assign the work but do not have time to explain the whole job to everybody.

<u>Decrease a Lot</u>	<u>Decrease a Little</u>	<u>Increase a Little</u>	<u>Increase a Lot</u>
GROUP.COORD	ACCURATE.COMM	NEED.FOR.FEEDBACK	
FEEDBACK	ANSWERS.AVAIL	NEED.FOR.	
AGREEABLE.	AVAIL.INFO	INFLUENCE	
GOALS	BELIEVABLE.COMM	NEED.FOR.SELF.	
CONFUSED.	CORRESP.TIMELY	CONTROL	
EXPECTATIONS	INFO.AVAIL	CONFLICT.	
	SATISFIED.COMM	ASSIGNMENT	
	BELONGING	CONFLICT.VALUES	
	MANAGEMENT.	INFORMATION.AVAIL	
	RESPONS	UNCLEAR.RESPONS	
	COMPLAINTS		
	TENSION		
	MEANINGFUL.WORK		
	SELF.FEEDBACK		
	STIMULATING.WORK		
	SUP.ACCEPTANCE		
	SUP.CONSIDERATE		
	SUP.COOPERATIVE		
	ADVANCEMENT		
	COMPLIMENTS		
	GROUP.FEEDBACK		
	GOAL.ACHIEVEMENT		
	KNOWLEDGE.OF.JOB		
	NEED.WORK		
	WORK.IDENTITY		

Situation 13.

A new supervisor arrived. This supervisor wants to get the work done right. He clarified work responsibilities and expectations. He also did away with some of the confusing policies of the past.

<u>Decrease a Lot</u>	<u>Decrease a Little</u>	<u>Increase a Little</u>	<u>Increase a Lot</u>
<u>CONFLICT.</u>	<u>NEED.FOR.FEEDBACK</u>	<u>ACCURATE.COMM</u>	<u>RESTRICTIONS</u>
<u>ASSIGNMENT</u>	<u>NEED.FOR.SELF.</u>	<u>ANSWERS.AVAIL</u>	<u>AGREEABLE.</u>
<u>CONFLICT.</u>	<u>CONTROL</u>	<u>AVAIL.INFO</u>	<u>GOALS</u>
<u>DEMANDS</u>	<u>CONFLICT.VALUES</u>	<u>INFO.AVAIL</u>	<u>CONFUSED.</u>
<u>CONFUSED.</u>	<u>USE.OF.RESOURCES</u>	<u>MANAGEMENT.</u>	<u>EXPECTATIONS</u>
<u>PLANNING</u>		<u>RESPONS</u>	<u>NEEDED.WORK</u>
<u>UNCLEAR.</u>		<u>MANAGEMENT.</u>	<u>NEGLECTED.WORK</u>
<u>RESPONS</u>		<u>SUPPORT</u>	
		<u>COMPLAINTS</u>	
		<u>DISSATISFACTION</u>	
		<u>TRIVIAL.WORK</u>	
		<u>SUP.CONFIDENT</u>	
		<u>SUP.CONSIDERATE</u>	
		<u>SUP.COOPERATIVE</u>	
		<u>SUP.SUPPORTIVE</u>	
		<u>COMPLIMENTS</u>	
		<u>FEEDBACK</u>	
		<u>IMPRESSIVE.WORK</u>	
		<u>INFLUENCE</u>	
		<u>KNOWLEDGE.OF.JOB</u>	

APPENDIX 13
COMPUTER LISTING OF SPECIAL FUNCTIONS AND FUZZY ALGORITHMS

This appendix lists the LISP computer code defining the special functions and constants used by the consultant.

```
;; -- Mode:Zetalisp; Package:KEE; Base:10 --
```

```
(defvar maxrange 1.0) ;Maximum of input values
(defvar max.answer 7) ;Maximum input answer
(defvar min.answer 1) ;Minimum input answer
(defvar mid.answer 4) ;Middle value of answers
(defvar positive 0.1) ;Constant to indicate a positive
  number
(defvar negative -0.1) ;Constant to indicate a negative
  number
(defvar high 0.5) ;Constant to indicate a high val
ue
(defvar low -0.5) ;Constant to indicate a low valu
e
(defvar real.high 0.7) ;Constant indicating a very high
  value
(defvar real.low -0.7) ;Constant indicating a very low
  value

(defvar plus.root 1.5) ;The root used by plus.ave
  and neg.ave in fuzzy algorithms
(defvar plus.plus.root 2.0) ;The root used by plus.plus.ave
  and neg.neg.ave in fuzzy algori
thms

(defun countatoms (a) ;Utility to count size of a list
  (cond ((null a) 0)
        ((Stringp a) 0)
        ((symbolp a) 0)
        ((NumberP a) 1)
        (t (+ (countatoms (car a))(countatoms (cdr a))))))

(defun average.of (a.list) ;Average of the numeric values
  (prog (count) ;in a list
    (setq count (countatoms a.list))
    (return (cond ((< count 1) 0) ;List empty
                  (t(%div (sum. a.list) count))))))

(defun sum. (s)
  (cond ((null s) 0)
        ((Stringp s) 0)
        ((symbolp s) 0)
        ((Numberp s) s)
        (t (+ (sum. (car s))(sum. (cdr s))))))

(defun greater.than (a b) ;Special greater than
  (cond ((null a) nil) ;to avoid null problems
        ((null b) nil)
        ((listp a) (greater.than (average.of a) b))
        ((listp b) (greater.than a (average.of b)))
        ((> a b) t)
        (t nil)))

(defun less.than (a b) ;Special less than
  (cond ((null a) nil) ;to avoid null problems
        ((null b) nil)
        ((listp a) (less.than (average.of a) b))
        ((listp b) (less.than a (average.of b)))
        ((< a b) t)
        (t nil)))

(defun more (a list) ;A fuzzy algorithm to increase
  (prog (count) ;a value a little
    (setq count (countatoms a list)))
```

```

(return (cond ((< count 1) 0) ;List empty
              (t(* (- (%div (plus.sum.root a.list) count) 0.5) 2))))))

(defun plus.sum.root (s)
  (cond ((null s) 0)
        ((atom s)
         (cond ((<= s -1) 0)
               (t (exp (%div (log (+ (%div s 2) 0.5)) plus.root))))))
  (t (+ (plus.sum.root (car s))(plus.sum.root (cdr s)))))

(defun much.more (a.list) ;A fuzzy algorithm to increase
  (prog (count) ;a value a lot
    (setq count (countatoms a.list))
    (return (cond ((< count 1) 0) ;List empty
                  (t(* (- (%div (plus.plus.sum.root a.list) count) 0.5) 2))))
  )))

(defun plus.plus.sum.root (s)
  (cond ((null s) 0)
        ((atom s)
         (cond ((<= s -1) 0)
               (t (exp (%div (log (+ (%div s 2) 0.5)) plus.plus.root))))))
  (t (+ (plus.plus.sum.root (car s))(plus.plus.sum.root (cdr s)))))

(defun less (a.list) ;A fuzzy algorithm to decrease
  (prog (count) ;a value a little
    (setq count (countatoms a.list))
    (return (cond ((< count 1) 0) ;List empty
                  (t(* (- (%div (neg.sum.root a.list) count) 0.5) 2))))))

(defun neg.sum.root (s)
  (cond ((null s) 0)
        ((atom s)
         (cond ((<= s -1) 0)
               (t (exp (* (log (+ (%div s 2) 0.5)) plus.root))))))
  (t (+ (neg.sum.root (car s))(neg.sum.root (cdr s)))))

(defun much.less (a.list) ;A fuzzy algorithm to decrease
  (prog (count) ;a value a lot
    (setq count (countatoms a.list))
    (return (cond ((< count 1) 0) ;List empty
                  (t(* (- (%div (neg.neg.sum.root a.list) count) 0.5) 2))))
  )

(defun neg.neg.sum.root (s) ;Sum of nth roots
  (cond ((null s) 0)
        ((atom s)
         (cond ((<= s -1) 0)
               (t (exp (* (log (+ (%div s 2) 0.5)) plus.plus.root))))))
  (t (+ (neg.neg.sum.root (car s))(neg.neg.sum.root (cdr s)))))

```

APPENDIX 19
COMPUTER LISTING OF METHODS

This appendix lists the definitions of all the methods used by the consultant to operate and control the system.

```

... -- Mode: LISP; Package: KEE; Base: 10. --

(DEFUN |CONSULTANT>1 CONSULTANT.CONTROL::IND.CLIMATE.CALC!method| (THISUNIT PERS
ON TO USE)
  (LOOP FOR
    CALC
    IN
    (UNITSLOTNAMES 'IND.CLIMATE.VAR.CALC 'MEMBER)
    DO
    (UNITMSG PERSON.TO.USE CALC)))

(DEFUN |CONSULTANT>1 CONSULTANT.CONTROL::INPUT.INDIVIDUALS!method| (THISUNIT)
  (PROG (NAME.PERSON NAME.ORG)
    (FORMAT T "Enter the name of the individual to be added.~%")
    (SETQ NAME.PERSON (READ))
    (COND ((NULL NAME.PERSON)
      (FORMAT T "END of individual entry.~%")
      (RETURN NIL))
      ((UNIT.CHILDP NAME.PERSON 'INDIVIDUALS 'MEMBER)
      (FORMAT T "This person already exists.~%")
      (RETURN NIL))
      (T
      (CREATE.UNIT NAME.PERSON 'CONSULTANT NIL 'INDIVIDUALS)
      (FORMAT T "Which organization does ~A belong to?~%" NAME.PERSON)
      (SETQ NAME.ORG (READ))
      (COND ((NULL NAME.ORG)
        (FORMAT T "~A must belong to some organization." NAME.PERS
ON)
        (RETURN NIL))
        ((UNIT.CHILDP NAME.ORG 'ORGANIZATIONS 'MEMBER)
        (ADD.VALUE NAME.ORG 'MEMBERS.OF.ORG NAME.PERSON))
        (T (FORMAT T "~%PLEASE LOAD ORGANIZATIONS FIRST~%~%"))))
      (UNITMSG THISUNIT 'INPUT.ATTRIBUTE.VALUES NAME.PERSON))))))

(DEFUN |CONSULTANT>1 CONSULTANT.CONTROL::VALIDATE.MODEL!method| (THISUNIT)
  (UNITMSG THISUNIT 'UPDATE.TOTAL.SYSTEM)
  (LOOP FOR
    GROUP.TO.TEST
    IN
    (GET.VALUES 'ORGANIZATIONS 'ORDER.TO.EVALUATE 'VALUE 'OWN)
    DO
    (UNITMSG THISUNIT 'TEST.ORG.SITUATIONS GROUP.TO.TEST)))

(DEFUN |CONSULTANT>1 CONSULTANT.CONTROL::UPDATE.PERSON!method| (THISUNIT PERSON.
TO USE)
  (UNITMSG THISUNIT 'IND.CLIMATE.CALC PERSON.TO.USE)
  (UNITMSG THISUNIT 'IND.INTERMEDIATE.VAR.CALC PERSON.TO.USE)
  (UNITMSG THISUNIT 'IND.OVERALL.CLIMATE.CALC PERSON.TO.USE)
  (UNITMSG THISUNIT 'APPLY.BEHAVIOR.RULES PERSON.TO.USE)
  (UNITMSG THISUNIT 'IND.OVERALL.PERFORMANCE.CALC PERSON.TO.USE))

(DEFUN |CONSULTANT>1 CONSULTANT.CONTROL::TEST.SITUATION!method| (THISUNIT WHICH
SITUATION
                                WHICH.ORGANIZAT
ION)
  (UNITMSG WHICH.SITUATION 'TEST.EFFECT.OF.SITUATION WHICH.ORGANIZATION))

(DEFUN |CONSULTANT>1 CONSULTANT.CONTROL::UPDATE.TOTAL.SYSTEM!method| (THISUNIT)
  (LOOP FOR
    ORG
    IN
    (GET.VALUES 'ORGANIZATIONS 'ORDER.TO.EVALUATE 'VALUE 'OWN)
    DO
    (UNITMSG THISUNIT 'UPDATE.ORG.ORG)))

(DEFUN |CONSULTANT>1 CONSULTANT.CONTROL::ORG.CLIMATE.CALC!method| (THISUNIT
                                GROUP.TO.USE

```

```

FOR CALC)
  (LOOP FOR
    CALC
    IN
    (UNITSLOTNAMES 'ORG.CLIMATE.VAR.CALC 'MEMBER)
    DO
    (UNITMSG GROUP.TO.USE.FOR.CALC CALC)))

(DEFUN |CONSULTANT>1.CONSULTANT.CONTROL::IND.INTERMEDIATE.VAR.CALC!method| (THIS
UNIT
                                                                    PERS
ON.TO.USE)
  (LOOP FOR
    CALC
    IN
    (UNITSLOTNAMES 'INTERMEDIATE.VAR.CALC 'MEMBER)
    DO
    (UNITMSG PERSON.TO.USE CALC)))

(DEFUN |CONSULTANT>1.CONSULTANT.CONTROL::IND.OVERALL.CLIMATE.CALC!method| (THISU
NIT
                                                                    PERSO
N.TO.USE)
  (UNITMSG PERSON.TO.USE 'OVERALL.CLIMATE.CALC))

(DEFUN
|CONSULTANT>1.CONSULTANT.CONTROL::DISPLAY.IND.VALUES!method|
(THISUNIT PERSON.TO.DISPLAY)
(PROG NIL
  (PUT.VALUE 'DISPLAY.PERSON 'NAME PERSON.TO.DISPLAY)
  (LOOP FOR
    VAR
    IN
    (UNITSLOTNAMES 'CLIMATE.VARIABLES 'MEMBER)
    DO
    (PUT.VALUE 'DISPLAY.PERSON VAR (GET.VALUE PERSON.TO.DISPLAY VAR 'VA
LUE 'OWN)))
  (LOOP FOR
    VAR
    IN
    (UNITSLOTNAMES 'PERFORMANCE.OVERALL 'MEMBER)
    DO
    (PUT.VALUE 'DISPLAY.PERSON VAR (GET.VALUE PERSON.TO.DISPLAY VAR 'VA
LUE 'OWN)))
  (PUT.VALUE 'DISPLAY.PERSON
    'OVERALL.CLIMATE
    (GET.VALUE PERSON.TO.DISPLAY 'OVERALL.CLIMATE 'VALUE 'OWN))
  (UNITMSG 'IMAGE.PANEL07581 'REDISPLAY)))

(DEFUN |CONSULTANT>1.CONSULTANT.CONTROL::ORG.PERFORMANCE.CALC!method| (THISUNIT
                                                                    GROUP TO
USE.FOR.CALC)
  (LOOP FOR
    CALC
    IN
    (UNITSLOTNAMES 'ORG.PERFORMANCE.CALC 'MEMBER)
    DO
    (UNITMSG GROUP.TO.USE.FOR.CALC CALC)))

(DEFUN |CONSULTANT>1.CONSULTANT.CONTROL.INPUT.ATTRIBUTE.VALUES!method| (THISUNI
T
                                                                    NAME OF
PERSON)
  (PROG (ATT.VALUE)
    (COND ((UNIT.CHILDP.NAME.OF.PERSON 'INDIVIDUALS 'MEMBER)
      (LOOP FOR
        CLIMATE.V

```



```

IN
(UNIT.CHILDREN 'ATTRIBUTES 'SUBCLASS)
DO
  (LOOP FOR
    ATT
    IN
    (UNITSLOTNAMES CLIMATE.V 'MEMBER)
    DO
      (FORMAT T
        "%~For ~A, what is the value of ~A? "
        NAME.OF.PERSON
        ATT)
      (SETQ ATT.VALUE (READ))
      (COND ((NULL ATT.VALUE)
        (PUT.VALUE NAME.OF.PERSON ATT 0))
        (> ATT.VALUE MAX.ANSWER)
        (FORMAT T
          "%~ENTRY GREATER THAN ~D. WILL USE ~D.
          MAX.ANSWER
          MAX.ANSWER)
        (PUT.VALUE NAME.OF.PERSON ATT MAXRANGE))
        (< ATT.VALUE MIN.ANSWER)
        (FORMAT T
          "%~ENTRY LESS THAN ~D. WILL USE ~D.~%
          MIN.ANSWER
          MIN.ANSWER)
        (PUT.VALUE NAME.OF.PERSON ATT (- MAXRANGE)))
        (T (PUT.VALUE NAME.OF.PERSON
          ATT
          (* (%DIV (- ATT.VALUE MID.ANSWER)
            MID.ANSWER)
            MAXRANGE))))))
        (T (FORMAT T "%~A was not found.~%" NAME.OF.PERSON))))))

(DEFUN |CONSULTANT>1.CONSULTANT.CONTROL::IND.OVERALL.PERFORMANCE.CALC!method| (T
THISUNIT
P
PERSON TO USE)
  (LOOP FOR
    CALC
    IN
    (UNITSLOTNAMES 'IND.PERFORMANCE.CALC 'MEMBER)
    DO
    (UNITMSG PERSON.TO.USE CALC)))

(DEFUN |CONSULTANT>1.CONSULTANT.CONTROL::TEST.ORG.SITUATIONS!method| (THISUNIT G
ROUP TO TEST)
  (LOOP FOR
    SITUATION
    IN
    (UNIT.CHILDREN '2.MANAGEMENT.SITUATIONS 'MEMBER)
    DO
    (UNITMSG SITUATION 'TEST.EFFECT.OF.SITUATION.GROUP.TO.TEST)))

(DEFUN |CONSULTANT>1.CONSULTANT.CONTROL::UPDATE.ORG!method| (THISUNIT GROUP TO U
SE FOR CALC)
  (LOOP FOR
    PERSON TO USE
    IN
    (GET.VALUES.GROUP.TO.USE.FOR.CALC 'MEMBERS.OF.ORG 'VALUE 'OWN)
    DO
    (UNITMSG THISUNIT 'UPDATE.PERSON.PERSON.TO.USE))
  (UNITMSG THISUNIT 'ORG.CLIMATE.CALC.GROUP.TO.USE.FOR.CALC)
  (UNITMSG THISUNIT 'ORG.PERFORMANCE.CALC.GROUP.TO.USE.FOR.CALC))

```

```

(DEFUN |CONSULTANT>1. CONSULTANT.CONTROL::DISPLAY.ORG.VALUES!method| (THISUNIT
                                ORGANIZATION
N. TO DISPLAY)
  (PROG NIL
    (PUT.VALUE 'DISPLAY.ORG 'NAME ORGANIZATION. TO DISPLAY)
    (LOOP FOR
      VAR
      IN
      (UNITSLOTNAMES 'CLIMATE.VARIABLES 'MEMBER)
      DO
      (PUT.VALUE 'DISPLAY.ORG
        VAR
        (GET.VALUE ORGANIZATION. TO DISPLAY VAR 'VALUE 'OWN)))
    (LOOP FOR
      VAR
      IN
      (UNITSLOTNAMES 'ORG.PERFORMANCE.MEASURES 'MEMBER)
      DO
      (PUT.VALUE 'DISPLAY.ORG
        VAR
        (GET.VALUE ORGANIZATION. TO DISPLAY VAR 'VALUE 'OWN)))
    (PUT.VALUE 'DISPLAY.ORG
      'OVERALL.CLIMATE
      (GET.VALUE ORGANIZATION. TO DISPLAY 'OVERALL.CLIMATE 'VALUE 'O
WN))
    (PUT.VALUE 'DISPLAY.ORG
      'OVERALL.PERFORMANCE
      (GET.VALUE ORGANIZATION. TO DISPLAY 'OVERALL.PERFORMANCE 'VALU
E 'OWN))
    (UNITMSG 'IMAGE.PANEL07441 'REDISPLAY)
    (UNITMSG 'IMAGE.PANEL02481 'REDISPLAY)))

(DEFUN |CONSULTANT>1 CONSULTANT.CONTROL::APPLY.BEHAVIOR.RULES!method| (THISUNIT
PERSON. TO USE)
  (LOOP FOR
    MEASURE
    IN
    (UNITSLOTNAMES 'IND.PERFORMANCE.MEASURES 'MEMBER)
    DO
    (REMOVE.ALL LOCAL.VALUES PERSON. TO USE MEASURE 'VALUE 'OWN))
  (LOOP FOR
    RULE
    IN
    (UNITSLOTNAMES 'BEHAVIOR.RULES 'MEMBER)
    DO
    (UNITMSG 'BEHAVIOR.RULES RULE PERSON. TO USE)))

(DEFUN |CONSULTANT>2.MANAGEMENT.SITUATIONS:TEST.EFFECT OF.SITUATION!method| (THI
SUNIT
                                GRO
UP. TO TEST)
  (PROG
    (A ACHIEVEMENT A EFFECTIVENESS
      A EFFICIENCY
      A EXCELLENCE
      A REALIZATION OF POTENTIAL
      A JOB SATISFACTION
      A NEED FULFILLMENT
      A SELF REALIZATION
      A OVERALL PERFORMANCE
      B ACHIEVEMENT
      B EFFECTIVENESS
      B EFFICIENCY
      B EXCELLENCE
      B REALIZATION OF POTENTIAL
      B JOB SATISFACTION
      B NEED FULFILLMENT

```

```

      B.SELF.REALIZATION
      B OVERALL PERFORMANCE)
(COND
  ((UNIT CHILDP GROUP TO TEST 'ORGANIZATIONS 'MEMBER)
    (SETQ B.ACHIEVEMENT (GET VALUE GROUP TO TEST 'ACHIEVEMENT 'VALUE 'OWN))
    (SETQ B.EFFECTIVENESS (GET VALUE GROUP TO TEST 'EFFECTIVENESS 'VALUE 'OWN))
    (SETQ B.EFFICIENCY (GET VALUE GROUP TO TEST 'EFFICIENCY 'VALUE 'OWN))
    (SETQ B.EXCELLENCE (GET VALUE GROUP TO TEST 'EXCELLENCE 'VALUE 'OWN))
    (SETQ B.REALIZATION.OF.POTENTIAL (GET VALUE GROUP TO TEST
                                      'REALIZATION.OF.POTENTIAL
                                      'VALUE
                                      'OWN))
      (SETQ B.JOB.SATISFACTION (GET VALUE GROUP TO TEST 'JOB.SATISFACTION 'VALUE
'OWN))
      (SETQ B.NEED.FULFILLMENT (GET VALUE GROUP TO TEST 'NEED.FULFILLMENT 'VALUE
'OWN))
      (SETQ B.SELF.REALIZATION (GET VALUE GROUP TO TEST 'SELF.REALIZATION 'VALUE
'OWN))
      (SETQ B.OVERALL.PERFORMANCE (GET VALUE GROUP TO TEST 'OVERALL.PERFORMANCE '
VALUE 'OWN))
      (UNITCOPY GROUP TO TEST 'HOLD.GROUP)
      (UNITMSG '1 CONSULTANT CONTROL 'DISPLAY.ORG.VALUES GROUP TO TEST)
      (LOOP FOR
        PERSON
        IN
        (GET VALUES GROUP TO TEST 'MEMBERS.OF.ORG 'VALUE 'OWN)
        DO
        (UNITMSG '1 CONSULTANT CONTROL 'DISPLAY.IND.VALUES PERSON)
        (LOOP FOR
          ATT
          IN
          (GET VALUES THISUNIT 'INCREASE.A.LITTLE)
          DO
          (PUT VALUE PERSON ATT (MORE (GET VALUE PERSON ATT 'VALUE 'OWN))
        ))
        (LOOP FOR
          ATT
          IN
          (GET VALUES THISUNIT 'INCREASE.A.LOT)
          DO
          (PUT VALUE PERSON ATT (MUCH MORE (GET VALUE PERSON ATT 'VALUE '
OWN))))
        (LOOP FOR
          ATT
          IN
          (GET VALUES THISUNIT 'DECREASE.A.LITTLE)
          DO
          (PUT VALUE PERSON ATT (LESS (GET VALUE PERSON ATT 'VALUE 'OWN))
        ))
        (LOOP FOR
          ATT
          IN
          (GET VALUES THISUNIT 'DECREASE.A.LOT)
          DO
          (PUT VALUE PERSON ATT (MUCH LESS (GET VALUE PERSON ATT 'VALUE '
OWN))))
      (UNITMSG '1 CONSULTANT CONTROL 'DISPLAY.IND.VALUES PERSON))
      (UNITMSG '1 CONSULTANT CONTROL 'UPDATE.ORG.GROUP TO TEST)
      (SETQ A.ACHIEVEMENT (GET VALUE GROUP TO TEST 'ACHIEVEMENT 'VALUE 'OWN))
      (SETQ A.EFFECTIVENESS (GET VALUE GROUP TO TEST 'EFFECTIVENESS 'VALUE 'OWN))
      (SETQ A.EFFICIENCY (GET VALUE GROUP TO TEST 'EFFICIENCY 'VALUE 'OWN))
      (SETQ A.EXCELLENCE (GET VALUE GROUP TO TEST 'EXCELLENCE 'VALUE 'OWN))
      (SETQ A.REALIZATION.OF.POTENTIAL (GET VALUE GROUP TO TEST
                                      'REALIZATION.OF.POTENTIAL
                                      'VALUE
                                      'OWN))
      (SETQ A.JOB.SATISFACTION (GET VALUE GROUP TO TEST 'JOB.SATISFACTION 'VALUE

```

```

'OWN))
  (SETQ A.NEED.FULFILLMENT (GET.VALUE GROUP.TO.TEST 'NEED.FULFILLMENT 'VALUE
'OWN))
  (SETQ A.SELF.REALIZATION (GET.VALUE GROUP.TO.TEST 'SELF.REALIZATION 'VALUE
'OWN))
  (SETQ A.OVERALL.PERFORMANCE (GET.VALUE GROUP.TO.TEST 'OVERALL.PERFORMANCE '
VALUE 'OWN))
  (UNITMSG '1. CONSULTANT CONTROL 'DISPLAY.ORG.VALUES GROUP.TO.TEST)
  (UNITCOPY 'HOLD.GROUP GROUP.TO.TEST)
  (UNITMSG THISUNIT 'RESET.ATTRIBUTES GROUP.TO.TEST)
  (WITH-OPEN-FILE
    (FILE "X5:HOLT:SITUATION-RESP"
      :DIRECTION
      :OUTPUT
      :IF-EXISTS
      :APPEND
      :IF-DOES-NOT-EXIST
      :CREATE)
    (FORMAT FILE "~%For organization ~A" GROUP.TO.TEST)
    (FORMAT FILE "~%In situation ~A" THISUNIT)
    (FORMAT
      FILE
      "~%ACHIEVEMENT                Before ~6.3...F    After ~6.3...F    Difference
~6.3...F"
      B.ACHIEVEMENT
      A.ACHIEVEMENT
      (- A.ACHIEVEMENT B.ACHIEVEMENT))
    (FORMAT
      FILE
      "~%EFFECTIVENESS                Before ~6.3...F    After ~6.3...F    Differenc
e ~6.3...F"
      B.EFFECTIVENESS
      A.EFFECTIVENESS
      (- A.EFFECTIVENESS B.EFFECTIVENESS))
    (FORMAT
      FILE
      "~%EFFICIENCY                    Before ~6.3...F    After ~6.3...F    Differenc
e ~6.3...F"
      B.EFFICIENCY
      A.EFFICIENCY
      (- A.EFFICIENCY B.EFFICIENCY))
    (FORMAT
      FILE
      "~%EXCELLENCE                    Before ~6.3...F    After ~6.3...F    Differenc
e ~6.3...F"
      B.EXCELLENCE
      A.EXCELLENCE
      (- A.EXCELLENCE B.EXCELLENCE))
    (FORMAT
      FILE
      "~%REALIZATION.OF.POTENTIAL    Before ~6.3...F    After ~6.3...F    Differenc
e ~6.3...F"
      B.REALIZATION.OF.POTENTIAL
      A.REALIZATION.OF.POTENTIAL
      (- A.REALIZATION.OF.POTENTIAL B.REALIZATION.OF.POTENTIAL))
    (FORMAT
      FILE
      "~%JOB.SATISFACTION              Before ~6.3...F    After ~6.3...F    Differenc
e ~6.3...F"
      B.JOB.SATISFACTION
      A.JOB.SATISFACTION
      (- A.JOB.SATISFACTION B.JOB.SATISFACTION))
    (FORMAT
      FILE
      "~%NEED.FULFILLMENT              Before ~6.3...F    After ~6.3...F    Differen
ce ~6.3...F"
      B.NEED.FULFILLMENT

```

```

A.NEED.FULFILLMENT
(- A.NEED.FULFILLMENT B.NEED.FULFILLMENT))
(FORMAT
FILE
"~%SELF.REALIZATION          Before ~6,3...F    After ~6,3...F    Difference
e ~6,3...F"
B.SELF.REALIZATION
A.SELF.REALIZATION
(- A.SELF.REALIZATION B.SELF.REALIZATION))
(FORMAT
FILE
"~%OVERALL.PERFORMANCE      Before ~6,3...F    After ~6,3...F    Difference
~6,3...F"
B.OVERALL.PERFORMANCE
A.OVERALL.PERFORMANCE
(- A.OVERALL.PERFORMANCE B.OVERALL.PERFORMANCE)))
(T (FORMAT T "~%ORGANIZATION ~A NOT FOUND" GROUP.TO.TEST))))

(DEFUN |CONSULTANT>2.MANAGEMENT.SITUATIONS:RESET.ATTRIBUTES!method| (THISUNIT
WORK.GROUP
TO.RESET)
(COND ((UNIT.CHILDP WORK.GROUP.TO.RESET 'ORGANIZATIONS 'MEMBER)
      (LOOP FOR
        PERSON
        IN
        (GET.VALUES WORK.GROUP.TO.RESET 'MEMBERS.OF.ORG 'VALUE 'OWN)
        DO
        (LOOP FOR
          ATT
          IN
          (GET.VALUES THISUNIT 'INCREASE.A.LITTLE)
          DO
          (PUT.VALUE PERSON ATT (LESS (GET.VALUE PERSON ATT 'VALUE 'O
WN))))))
      (LOOP FOR
        ATT
        IN
        (GET.VALUES THISUNIT 'INCREASE.A.LOT)
        DO
        (PUT.VALUE PERSON ATT (MUCH.LESS (GET.VALUE PERSON ATT 'VAL
UE 'OWN))))))
      (LOOP FOR
        ATT
        IN
        (GET.VALUES THISUNIT 'DECREASE.A.LITTLE)
        DO
        (PUT.VALUE PERSON ATT (MORE (GET.VALUE PERSON ATT 'VALUE 'O
WN))))))
      (LOOP FOR
        ATT
        IN
        (GET.VALUES THISUNIT 'DECREASE.A.LOT)
        DO
        (PUT.VALUE PERSON ATT (MUCH.MORE (GET.VALUE PERSON ATT 'VAL
UE 'OWN))))))
      (UNITMSG '1 CONSULTANT.CONTROL 'ORG.CLIMATE.CALC WORK.GROUP.TO.RESET)
      (UNITMSG '1 CONSULTANT.CONTROL 'ORG.PERFORMANCE.CALC WORK.GROUP.TO.RESE
T))
      (FORMAT
T
"~%ORGANIZATION ~A NOT FOUND"
WORK.GROUP.TO.RESET)))

(DEFUN |CONSULTANT>IND.CLIMATE.VAR.CALC.PHYSICAL.ENVIR.CALC!method| (THISUNIT)
(PUT.VALUE THISUNIT
'PHYSICAL.ENVIR
(AVERAGE.OF (LOOP FOR

```

```

ATTR
IN
(UNITSLOTNAMES 'ATT.PHYSICAL.ENVIR 'MEMBER)
COLLECT
(GET.VALUE THISUNIT ATTR 'VALUE 'OWN))))))

(DEFUN |CONSULTANT>IND.CLIMATE.VAR.CALC:COMM.EFFECTIVENESS.CALC!method| (THISUNIT)
  (PUT.VALUE THISUNIT
    'COMM.EFFECTIVENESS
    (AVERAGE.OF (LOOP FOR
      ATTR
      IN
      (UNITSLOTNAMES 'ATT.COMM.EFFECTIVENESS 'MEMBER)
      COLLECT
      (GET.VALUE THISUNIT ATTR 'VALUE 'OWN))))))

(DEFUN |CONSULTANT>IND.CLIMATE.VAR.CALC:LEADER.SUPER.CALC!method| (THISUNIT)
  (PUT.VALUE THISUNIT
    'LEADER.SUPER
    (AVERAGE.OF (LOOP FOR
      ATTR
      IN
      (UNITSLOTNAMES 'ATT.LEADER.SUPER 'MEMBER)
      COLLECT
      (GET.VALUE THISUNIT ATTR 'VALUE 'OWN))))))

(DEFUN |CONSULTANT>IND.CLIMATE.VAR.CALC:STANDARDS.GOALS.CALC!method| (THISUNIT)
  (PUT.VALUE THISUNIT
    'STANDARDS.GOALS
    (AVERAGE.OF (LOOP FOR
      ATTR
      IN
      (UNITSLOTNAMES 'ATT.STANDARDS.GOALS 'MEMBER)
      COLLECT
      (GET.VALUE THISUNIT ATTR 'VALUE 'OWN))))))

(DEFUN |CONSULTANT>IND.CLIMATE.VAR.CALC:INTERPERSONAL.REL.CALC!method| (THISUNIT)
  (PUT.VALUE THISUNIT
    'INTERPERSONAL.REL
    (AVERAGE.OF (LOOP FOR
      ATTR
      IN
      (UNITSLOTNAMES 'ATT.INTERPERSONAL.REL 'MEMBER)
      COLLECT
      (GET.VALUE THISUNIT ATTR 'VALUE 'OWN))))))

(DEFUN |CONSULTANT>IND.CLIMATE.VAR.CALC:STRESS.CALC!method| (THISUNIT)
  (PUT.VALUE THISUNIT
    'STRESS
    (AVERAGE.OF (LOOP FOR
      ATTR
      IN
      (UNITSLOTNAMES 'ATT.STRESS 'MEMBER)
      COLLECT
      (GET.VALUE THISUNIT ATTR 'VALUE 'OWN))))))

(DEFUN |CONSULTANT>IND.CLIMATE.VAR.CALC:PERSONAL.NEEDS.CALC!method| (THISUNIT)
  (PUT.VALUE THISUNIT
    'PERSONAL.NEEDS
    (AVERAGE.OF (LOOP FOR
      ATTR
      IN
      (UNITSLOTNAMES 'ATT.PERSONAL.NEEDS 'MEMBER)
      COLLECT
      (GET.VALUE THISUNIT ATTR 'VALUE 'OWN))))))

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(DEFUN |CONSULTANT>IND.CLIMATE.VAR.CALC:REWARD.SYS.CALC!method| (THISUNIT)
  (PUT.VALUE THISUNIT
    'REWARD.SYS
    (AVERAGE.OF (LOOP FOR
      ATTR
      IN
      (UNITSLOTNAMES 'ATT.REWARD.SYS 'MEMBER)
      COLLECT
      (GET.VALUE THISUNIT ATTR 'VALUE 'OWN))))))

(DEFUN |CONSULTANT>IND.CLIMATE.VAR.CALC:JOB.EVALUATION.CALC!method| (THISUNIT)
  (PUT.VALUE THISUNIT
    'JOB.EVALUATION
    (AVERAGE.OF (LOOP FOR
      ATTR
      IN
      (UNITSLOTNAMES 'ATT.JOB.EVALUATION 'MEMBER)
      COLLECT
      (GET.VALUE THISUNIT ATTR 'VALUE 'OWN))))))

(DEFUN |CONSULTANT>IND.CLIMATE.VAR.CALC:IND.ORG.CONTROL.CALC!method| (THISUNIT)
  (PUT.VALUE THISUNIT
    'IND.ORG.CONTROL
    (AVERAGE.OF (LOOP FOR
      ATTR
      IN
      (UNITSLOTNAMES 'ATT.IND.ORG.CONTROL 'MEMBER)
      COLLECT
      (GET.VALUE THISUNIT ATTR 'VALUE 'OWN))))))

(DEFUN |CONSULTANT>IND.PERFORMANCE.CALC:JOB.MOTIVATION.CALC!method| (THISUNIT)
  (PUT.VALUE THISUNIT
    'JOB.MOTIVATION.OVERALL
    (AVERAGE.OF (GET.VALUES THISUNIT 'JOB.MOTIVATION 'VALUE 'OWN))))

(DEFUN |CONSULTANT>IND.PERFORMANCE.CALC:EFFECTIVENESS.CALC!method| (THISUNIT)
  (PUT.VALUE THISUNIT
    'EFFECTIVENESS.OVERALL
    (AVERAGE.OF (GET.VALUES THISUNIT 'EFFECTIVENESS 'VALUE 'OWN))))

(DEFUN |CONSULTANT>IND.PERFORMANCE.CALC:EFFICIENCY.CALC!method| (THISUNIT)
  (PUT.VALUE THISUNIT
    'EFFICIENCY.OVERALL
    (AVERAGE.OF (GET.VALUES THISUNIT 'EFFICIENCY 'VALUE 'OWN))))

(DEFUN |CONSULTANT>IND.PERFORMANCE.CALC:EXCELLENCE.CALC!method| (THISUNIT)
  (PUT.VALUE THISUNIT
    'EXCELLENCE.OVERALL
    (AVERAGE.OF (GET.VALUES THISUNIT 'EXCELLENCE 'VALUE 'OWN))))

(DEFUN |CONSULTANT>IND.PERFORMANCE.CALC:REALIZATION.OF.POTENTIAL.CALC!method| (THISUNIT)
  (PUT.VALUE THISUNIT
    'REALIZATION.OF.POTENTIAL.OVERALL
    (AVERAGE.OF (GET.VALUES THISUNIT 'REALIZATION.OF.POTENTIAL 'VALUE '
OWN))))

(DEFUN |CONSULTANT>IND.PERFORMANCE.CALC:ACHIEVEMENT.CALC!method| (THISUNIT)
  (PUT.VALUE THISUNIT
    'ACHIEVEMENT.OVERALL
    (AVERAGE.OF (GET.VALUES THISUNIT 'ACHIEVEMENT 'VALUE 'OWN))))

(DEFUN |CONSULTANT>IND.PERFORMANCE.CALC:SELF.REALIZATION.CALC!method| (THISUNIT)
  (PUT.VALUE THISUNIT
    'SELF.REALIZATION.OVERALL
    (AVERAGE.OF (GET.VALUES THISUNIT 'SELF.REALIZATION 'VALUE 'OWN))))

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(DEFUN |CONSULTANT>IND.PERFORMANCE.CALC:JOB.SATISFACTION.CALC!method| (THISUNIT)
  (PUT.VALUE THISUNIT
    'JOB.SATISFACTION.OVERALL
    (AVERAGE.OF (GET.VALUES THISUNIT 'JOB.SATISFACTION 'VALUE 'OWN))))

(DEFUN |CONSULTANT>IND.PERFORMANCE.CALC:NEED.FULFILLMENT.CALC!method| (THISUNIT)
  (PUT.VALUE THISUNIT
    'NEED.FULFILLMENT.OVERALL
    (AVERAGE.OF (GET.VALUES THISUNIT 'NEED.FULFILLMENT 'VALUE 'OWN))))

(DEFUN |CONSULTANT>INTERMEDIATE.VAR.CALC:INTRINSIC.REWARD.CALC!method| (THISUNIT)
  (PUT.VALUE THISUNIT
    'INTRINSIC.REWARD
    (AVERAGE.OF (LOOP FOR
      ATT.VALUE
      IN
      (GET.VALUES 'INTERMEDIATE.VARIABLES
        'INTRINSIC.REWARD.MEMBERS
        'VALUE
        'OWN)
      COLLECT
      (GET.VALUE THISUNIT ATT.VALUE 'VALUE 'OWN))))))

(DEFUN |CONSULTANT>INTERMEDIATE.VAR.CALC:ADEQUATE.ENVIRONMENT.CALC!method| (THISUNIT)
  (PUT.VALUE THISUNIT
    'ADEQUATE.ENVIRONMENT
    (AVERAGE.OF (LOOP FOR
      ATT.VALUE
      IN
      (GET.VALUES 'INTERMEDIATE.VARIABLES
        'ADEQUATE.ENVIRONMENT.MEMBERS
        'VALUE
        'OWN)
      COLLECT
      (GET.VALUE THISUNIT ATT.VALUE 'VALUE 'OWN))))))

(DEFUN |CONSULTANT>INTERMEDIATE.VAR.CALC:SATISFACTION.WITH.GROUP.CALC!method| (THISUNIT)
  (PUT.VALUE THISUNIT
    'SATISFACTION.WITH.GROUP
    (AVERAGE.OF (LOOP FOR
      ATT.VALUE
      IN
      (GET.VALUES 'INTERMEDIATE.VARIABLES
        'SATISFACTION.WITH.GROUP.MEMBERS
        'VALUE
        'OWN)
      COLLECT
      (GET.VALUE THISUNIT ATT.VALUE 'VALUE 'OWN))))))

(DEFUN |CONSULTANT>INTERMEDIATE.VAR.CALC:ROLE.CONFLICT.CALC!method| (THISUNIT)
  (PUT.VALUE THISUNIT
    'ROLE.CONFLICT
    (AVERAGE.OF (LOOP FOR
      ATT.VALUE
      IN
      (GET.VALUES 'INTERMEDIATE.VARIABLES
        'ROLE.CONFLICT.MEMBERS
        'VALUE
        'OWN)
      COLLECT
      (GET.VALUE THISUNIT ATT.VALUE 'VALUE 'OWN))))))

(DEFUN |CONSULTANT>INTERMEDIATE.VAR.CALC:JOB.CHALLENGE.CALC!method| (THISUNIT)

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(PUT.VALUE THISUNIT
  'JOB.CHALLENGE
  (AVERAGE.OF (LOOP FOR
    ATT.VALUE
    IN
    (GET.VALUES 'INTERMEDIATE.VARIABLES
      'JOB.CHALLENGE.MEMBERS
      'VALUE
      'OWN)
    COLLECT
    (GET.VALUE THISUNIT ATT.VALUE 'VALUE 'OWN))))))

(DEFUN |CONSULTANT>INTERMEDIATE.VAR.CALC:TASK.COMPETENCE.CALC!method| (THISUNIT)
  (PUT.VALUE THISUNIT
    'TASK.COMPETENCE
    (AVERAGE.OF (LOOP FOR
      ATT.VALUE
      IN
      (GET.VALUES 'INTERMEDIATE.VARIABLES
        'TASK.COMPETENCE.MEMBERS
        'VALUE
        'OWN)
      COLLECT
      (GET.VALUE THISUNIT ATT.VALUE 'VALUE 'OWN))))))

(DEFUN |CONSULTANT>INTERMEDIATE.VAR.CALC:EFFECTIVE.PARTICIPATION.CALC!method| (THISUNIT)
  (PUT.VALUE THISUNIT
    'EFFECTIVE.PARTICIPATION
    (AVERAGE.OF (LOOP FOR
      ATT.VALUE
      IN
      (GET.VALUES 'INTERMEDIATE.VARIABLES
        'EFFECTIVE.PARTICIPATION.MEMBERS
        'VALUE
        'OWN)
      COLLECT
      (GET.VALUE THISUNIT ATT.VALUE 'VALUE 'OWN))))))

(DEFUN |CONSULTANT>INTERMEDIATE.VAR.CALC:TEAMWORK.CALC!method| (THISUNIT)
  (PUT.VALUE THISUNIT
    'TEAMWORK
    (AVERAGE.OF (LOOP FOR
      ATT.VALUE
      IN
      (GET.VALUES 'INTERMEDIATE.VARIABLES
        'TEAMWORK.MEMBERS
        'VALUE
        'OWN)
      COLLECT
      (GET.VALUE THISUNIT ATT.VALUE 'VALUE 'OWN))))))

(DEFUN |CONSULTANT>INTERMEDIATE.VAR.CALC:INFLUENCE.ENVIRONMENT.CALC!method| (THISUNIT)
  (PUT.VALUE THISUNIT
    'INFLUENCE.ENVIRONMENT
    (AVERAGE.OF (LOOP FOR
      ATT.VALUE
      IN
      (GET.VALUES 'INTERMEDIATE.VARIABLES
        'INFLUENCE.ENVIRONMENT.MEMBERS
        'VALUE
        'OWN)
      COLLECT
      (GET.VALUE THISUNIT ATT.VALUE 'VALUE 'OWN))))))

(DEFUN |CONSULTANT>INTERMEDIATE.VAR.CALC:GROWTH.DEVELOP.CALC!method| (THISUNIT)

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(PUT.VALUE THISUNIT
  'GROWTH.DEVELOP
  (AVERAGE.OF (LOOP FOR
    ATT.VALUE
    IN
    (GET.VALUES 'INTERMEDIATE.VARIABLES
      'GROWTH.DEVELOP.MEMBERS
      'VALUE
      'OWN)
    COLLECT
    (GET.VALUE THISUNIT ATT.VALUE 'VALUE 'OWN))))))

(DEFUN |CONSULTANT>INTERMEDIATE.VAR.CALC:EXPECTATION.OF.REWARDS.CALC!method| (TH
ISUNIT)
  (PUT.VALUE THISUNIT
    'EXPECTATION.OF.REWARDS
    (AVERAGE.OF (LOOP FOR
      ATT.VALUE
      IN
      (GET.VALUES 'INTERMEDIATE.VARIABLES
        'EXPECTATION.OF.REWARDS.MEMBERS
        'VALUE
        'OWN)
      COLLECT
      (GET.VALUE THISUNIT ATT.VALUE 'VALUE 'OWN))))))

(DEFUN |CONSULTANT>INTERMEDIATE.VAR.CALC:PERSONAL.REL.COMPETENCE.CALC!method| (T
HISUNIT)
  (PUT.VALUE THISUNIT
    'PERSONAL.REL.COMPETENCE
    (AVERAGE.OF (LOOP FOR
      ATT.VALUE
      IN
      (GET.VALUES 'INTERMEDIATE.VARIABLES
        'PERSONAL.REL.COMPETENCE.MEMBERS
        'VALUE
        'OWN)
      COLLECT
      (GET.VALUE THISUNIT ATT.VALUE 'VALUE 'OWN))))))

(DEFUN |CONSULTANT>INTERMEDIATE.VAR.CALC:EXTRINSIC.REWARD.CALC!method| (THISUNIT
)
  (PUT.VALUE THISUNIT
    'EXTRINSIC.REWARD
    (AVERAGE.OF (LOOP FOR
      ATT.VALUE
      IN
      (GET.VALUES 'INTERMEDIATE.VARIABLES
        'EXTRINSIC.REWARD.MEMBERS
        'VALUE
        'OWN)
      COLLECT
      (GET.VALUE THISUNIT ATT.VALUE 'VALUE 'OWN))))))

(DEFUN |CONSULTANT>INTERMEDIATE.VAR.CALC:IMPORTANCE.OF.REWARDS.CALC!method| (THI
SUNIT)
  (PUT.VALUE THISUNIT
    'IMPORTANCE.OF.REWARDS
    (AVERAGE.OF (LOOP FOR
      ATT.VALUE
      IN
      (GET.VALUES 'INTERMEDIATE.VARIABLES
        'IMPORTANCE.OF.REWARDS.MEMBERS
        'VALUE
        'OWN)
      COLLECT
      (GET.VALUE THISUNIT ATT.VALUE 'VALUE 'OWN))))))

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(DEFUN |CONSULTANT>INTERMEDIATE.VAR.CALC:SKILL.VARIETY.HO.CALC!method| (THISUNIT
)
  (PUT.VALUE THISUNIT
    'SKILL.VARIETY.HO
    (AVERAGE.OF (LOOP FOR
      ATT.VALUE
      IN
      (GET.VALUES 'INTERMEDIATE.VARIABLES
        'SKILL.VARIETY.HO.MEMBERS
        'VALUE
        'OWN)
      COLLECT
      (GET.VALUE THISUNIT ATT.VALUE 'VALUE 'OWN))))))

(DEFUN |CONSULTANT>INTERMEDIATE.VAR.CALC:OVERALL.CLIMATE.CALC!method| (THISUNIT)
  (PUT.VALUE THISUNIT
    'OVERALL.CLIMATE
    (AVERAGE.OF (LOOP FOR
      ATT.VALUE
      IN
      (GET.VALUES 'INTERMEDIATE.VARIABLES
        'OVERALL.CLIMATE.MEMBERS
        'VALUE
        'OWN)
      COLLECT
      (GET.VALUE THISUNIT ATT.VALUE 'VALUE 'OWN))))))

(DEFUN |CONSULTANT>ORG.CLIMATE.VAR.CALC:PHYSICAL.ENVIR.CALC!method| (THISUNIT)
  (PUT.VALUE THISUNIT
    'PHYSICAL.ENVIR
    (AVERAGE.OF (LIST (AVERAGE.OF (LOOP FOR
      PERSONS
      IN
      (GET.VALUES THISUNIT
        'MEMBERS.OF.ORG
        'VALUE
        'OWN)
      COLLECT
      (GET.VALUE PERSONS
        'PHYSICAL.ENVIR
        'VALUE
        'OWN)))
      (LOOP FOR
        SUBORGS
        IN
        (GET.VALUES THISUNIT 'SUBORDINATE.ORGs 'VAL
UE 'OWN)
        COLLECT
        (GET.VALUE SUBORGS 'PHYSICAL.ENVIR 'VALUE '
OWN))))))

(DEFUN |CONSULTANT>ORG.CLIMATE.VAR.CALC:COMM.EFFECTIVENESS.CALC!method| (THISUNI
T)
  (PUT.VALUE THISUNIT
    'COMM.EFFECTIVENESS
    (AVERAGE.OF (LIST (AVERAGE.OF (LOOP FOR
      PERSONS
      IN
      (GET.VALUES THISUNIT
        'MEMBERS.OF.ORG
        'VALUE
        'OWN)
      COLLECT
      (GET.VALUE PERSONS
        'COMM.EFFECTIVENESS
        'VALUE

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                                'OWN)))
                                (LOOP FOR
                                  SUBORGS
                                  IN
                                  (GET.VALUES THISUNIT 'SUBORDINATE.ORG 'VAL
UE 'OWN)
                                  COLLECT
                                  (GET.VALUE SUBORGS 'COMM.EFFECTIVENESS 'VAL
UE 'OWN))))))
(DEFUN |CONSULTANT>ORG.CLIMATE.VAR.CALC:LEADER.SUPER.CALC!method| (THISUNIT)
  (PUT.VALUE THISUNIT
    'LEADER.SUPER
    (AVERAGE.OF (LIST (AVERAGE.OF (LOOP FOR
                                  PERSONS
                                  IN
                                  (GET.VALUES THISUNIT
                                    'MEMBERS.OF.ORG
                                    'VALUE
                                    'OWN)
                                  COLLECT
                                  (GET.VALUE PERSONS
                                    'LEADER.SUPER
                                    'VALUE
                                    'OWN))))
                                (LOOP FOR
                                  SUBORGS
                                  IN
                                  (GET.VALUES THISUNIT 'SUBORDINATE.ORG 'VAL
UE 'OWN)
                                  COLLECT
                                  (GET.VALUE SUBORGS 'LEADER.SUPER 'VALUE 'OW
N))))))
(DEFUN |CONSULTANT>ORG.CLIMATE.VAR.CALC:STANDARDS.GOALS.CALC!method| (THISUNIT)
  (PUT.VALUE THISUNIT
    'STANDARDS.GOALS
    (AVERAGE.OF (LIST (AVERAGE.OF (LOOP FOR
                                  PERSONS
                                  IN
                                  (GET.VALUES THISUNIT
                                    'MEMBERS.OF.ORG
                                    'VALUE
                                    'OWN)
                                  COLLECT
                                  (GET.VALUE PERSONS
                                    'STANDARDS.GOALS
                                    'VALUE
                                    'OWN))))
                                (LOOP FOR
                                  SUBORGS
                                  IN
                                  (GET.VALUES THISUNIT 'SUBORDINATE.ORG 'VAL
UE 'OWN)
                                  COLLECT
                                  (GET.VALUE SUBORGS 'STANDARDS.GOALS 'VALUE
'OWN))))))
(DEFUN |CONSULTANT>ORG.CLIMATE.VAR.CALC:INTERPERSONAL.REL.CALC!method| (THISUNIT
)
  (PUT.VALUE THISUNIT
    'INTERPERSONAL.REL
    (AVERAGE.OF (LIST (AVERAGE.OF (LOOP FOR
                                  PERSONS
                                  IN
                                  (GET.VALUES THISUNIT
                                    'MEMBERS.OF.ORG

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                                'VALUE
                                'OWN)
                                COLLECT
                                (GET.VALUE PERSONS
                                'INTERPERSONAL.REL
                                'VALUE
                                'OWN)))
                                (LOOP FOR
                                SUBORGS
                                IN
                                (GET.VALUES THISUNIT 'SUBORDINATE.ORGs 'VAL
UE 'OWN)
                                COLLECT
                                (GET.VALUE SUBORGS 'INTERPERSONAL.REL 'VALU
E 'OWN))))))
(DEFUN |CONSULTANT>ORG.CLIMATE.VAR.CALC:STRESS.CALC!method| (THISUNIT)
  (PUT.VALUE THISUNIT
   'STRESS
   (AVERAGE.OF (LIST (AVERAGE.OF (LOOP FOR
                                PERSONS
                                IN
                                (GET.VALUES THISUNIT
                                'MEMBERS.OF.ORG
                                'VALUE
                                'OWN)
                                COLLECT
                                (GET.VALUE PERSONS 'STRESS 'VAL
UE 'OWN)))
                                (LOOP FOR
                                SUBORGS
                                IN
                                (GET.VALUES THISUNIT 'SUBORDINATE.ORGs 'VAL
UE 'OWN)
                                COLLECT
                                (GET.VALUE SUBORGS 'STRESS 'VALUE 'OWN))))))
  )
(DEFUN |CONSULTANT>ORG.CLIMATE.VAR.CALC:PERSONAL.NEEDS.CALC!method| (THISUNIT)
  (PUT.VALUE THISUNIT
   'PERSONAL.NEEDS
   (AVERAGE.OF (LIST (AVERAGE.OF (LOOP FOR
                                PERSONS
                                IN
                                (GET.VALUES THISUNIT
                                'MEMBERS.OF.ORG
                                'VALUE
                                'OWN)
                                COLLECT
                                (GET.VALUE PERSONS
                                'PERSONAL.NEEDS
                                'VALUE
                                'OWN)))
                                (LOOP FOR
                                SUBORGS
                                IN
                                (GET.VALUES THISUNIT 'SUBORDINATE.ORGs 'VAL
UE 'OWN)
                                COLLECT
                                (GET.VALUE SUBORGS 'PERSONAL.NEEDS 'VALUE '
OWN))))))
  )
(DEFUN |CONSULTANT>ORG.CLIMATE.VAR.CALC:REWARD.SYS.CALC!method| (THISUNIT)
  (PUT.VALUE THISUNIT
   'REWARD.SYS
   (AVERAGE.OF (LIST (AVERAGE.OF (LOOP FOR
                                PERSONS

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                                IN
                                (GET.VALUES THISUNIT
                                  'MEMBERS.OF.ORG
                                  'VALUE
                                  'OWN)
                                COLLECT
                                (GET.VALUE PERSONS
                                  'REWARD.SYS
                                  'VALUE
                                  'OWN)))
                                (LOOP FOR
                                  SUBORGS
                                  IN
                                  (GET.VALUES THISUNIT 'SUBORDINATE.ORGs 'VAL
UE 'OWN)
                                  COLLECT
                                  (GET.VALUE SUBORGS 'REWARD.SYS 'VALUE 'OWN)
                                )))))
(DEFUN [CONSULTANT>ORG.CLIMATE.VAR.CALC:OVERALL.CLIMATE.CALC!method] (THISUNIT)
  (PUT.VALUE THISUNIT
    'OVERALL.CLIMATE
    (AVERAGE.OF (LIST (AVERAGE.OF (LOOP FOR
                                PERSONS
                                IN
                                (GET.VALUES THISUNIT
                                  'MEMBERS.OF.ORG
                                  'VALUE
                                  'OWN)
                                COLLECT
                                (GET.VALUE PERSONS
                                  'OVERALL.CLIMATE
                                  'VALUE
                                  'OWN)))
                                (LOOP FOR
                                  SUBORGS
                                  IN
                                  (GET.VALUES THISUNIT 'SUBORDINATE.ORGs 'VAL
UE 'OWN)
                                  COLLECT
                                  (GET.VALUE SUBORGS 'OVERALL.CLIMATE 'VALUE
'OWN)))))))
(DEFUN [CONSULTANT>ORG.CLIMATE.VAR.CALC:JOB.EVALUATION.CALC!method] (THISUNIT)
  (PUT.VALUE THISUNIT
    'JOB.EVALUATION
    (AVERAGE.OF (LIST (AVERAGE.OF (LOOP FOR
                                PERSONS
                                IN
                                (GET.VALUES THISUNIT
                                  'MEMBERS.OF.ORG
                                  'VALUE
                                  'OWN)
                                COLLECT
                                (GET.VALUE PERSONS
                                  'JOB.EVALUATION
                                  'VALUE
                                  'OWN)))
                                (LOOP FOR
                                  SUBORGS
                                  IN
                                  (GET.VALUES THISUNIT 'SUBORDINATE.ORGs 'VAL
UE 'OWN)
                                  COLLECT
                                  (GET.VALUE SUBORGS 'JOB.EVALUATION 'VALUE '
OWN)))))))

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(DEFUN |CONSULTANT>ORG.CLIMATE.VAR.CALC:IND.ORG.CONTROL.CALC!method| (THISUNIT)
  (PUT.VALUE THISUNIT
    'IND.ORG.CONTROL
    (AVERAGE.OF (LIST (AVERAGE.OF (LOOP FOR
      PERSONS
      IN
      (GET.VALUES THISUNIT
        'MEMBERS.OF.ORG
        'VALUE
        'OWN)
      COLLECT
      (GET.VALUE PERSONS
        'IND.ORG.CONTROL
        'VALUE
        'OWN))))
    (LOOP FOR
      SUBORGS
      IN
      (GET.VALUES THISUNIT 'SUBORDINATE.ORG 'VAL
        UE 'OWN)
      COLLECT
      (GET.VALUE SUBORGS 'IND.ORG.CONTROL 'VALUE
        'OWN))))))

(DEFUN |CONSULTANT>ORG.PERFORMANCE.CALC:JOB.MOTIVATION.CALC!method| (THISUNIT)
  (PUT.VALUE THISUNIT
    'JOB.MOTIVATION
    (AVERAGE.OF (LIST (AVERAGE.OF (LOOP FOR
      PERSONS
      IN
      (GET.VALUES THISUNIT
        'MEMBERS.OF.ORG
        'VALUE
        'OWN)
      COLLECT
      (GET.VALUES PERSONS
        'JOB.MOTIVATION
        'VALUE
        'OWN )
      (LOOP FOR
        SUBORGS
        IN
        (GET.VALUES THISUNIT 'SUBORDINATE.ORG 'VAL
          UE 'OWN)
        COLLECT
        (GET.VALUE SUBORGS 'JOB.MOTIVATION 'VALUE '
          OWN))))))

(DEFUN |CONSULTANT>ORG.PERFORMANCE.CALC:EFFECTIVENESS.CALC!method| (THISUNIT)
  (PUT.VALUE THISUNIT
    'EFFECTIVENESS
    (AVERAGE.OF (LIST (AVERAGE.OF (LOOP FOR
      PERSONS
      IN
      (GET.VALUES THISUNIT
        'MEMBERS.OF.ORG
        'VALUE
        'OWN)
      COLLECT
      (GET.VALUES PERSONS
        'EFFECTIVENESS
        'VALUE
        'OWN)))
    (LOOP FOR
      SUBORGS
      IN
      (GET.VALUES THISUNIT 'SUBORDINATE.ORG 'VAL

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UE 'OWN)
                                COLLECT
                                (GET.VALUE SUBORGS 'EFFECTIVENESS 'VALUE 'OWN)
WN))))))
(DEFUN |CONSULTANT>ORG.PERFORMANCE.CALC:EFFICIENCY.CALC!method| (THISUNIT)
  (PUT.VALUE THISUNIT
    'EFFICIENCY
    (AVERAGE.OF (LIST (AVERAGE.OF (LOOP FOR
                                PERSONS
                                IN
                                (GET.VALUES THISUNIT
                                    'MEMBERS.OF.ORG
                                    'VALUE
                                    'OWN)
                                COLLECT
                                (GET.VALUES PERSONS
                                    'EFFICIENCY
                                    'VALUE
                                    'OWN))))
    (LOOP FOR
      SUBORGS
      IN
      (GET.VALUES THISUNIT 'SUBORDINATE.ORGs 'VALUE
        'OWN)
      COLLECT
      (GET.VALUE SUBORGS 'EFFICIENCY 'VALUE 'OWN)
    ))))
(DEFUN |CONSULTANT>ORG.PERFORMANCE.CALC:EXCELLENCE.CALC!method| (THISUNIT)
  (PUT.VALUE THISUNIT
    'EXCELLENCE
    (AVERAGE.OF (LIST (AVERAGE.OF (LOOP FOR
                                PERSONS
                                IN
                                (GET.VALUES THISUNIT
                                    'MEMBERS.OF.ORG
                                    'VALUE
                                    'OWN)
                                COLLECT
                                (GET.VALUES PERSONS
                                    'EXCELLENCE
                                    'VALUE
                                    'OWN))))
    (LOOP FOR
      SUBORGS
      IN
      (GET.VALUES THISUNIT 'SUBORDINATE.ORGs 'VALUE
        'OWN)
      COLLECT
      (GET.VALUE SUBORGS 'EXCELLENCE 'VALUE 'OWN)
    ))))
(DEFUN |CONSULTANT>ORG.PERFORMANCE.CALC:REALIZATION.OF.POTENTIAL.CALC!method| (THISUNIT)
  (PUT.VALUE THISUNIT
    'REALIZATION.OF.POTENTIAL
    (AVERAGE.OF (LIST (AVERAGE.OF (LOOP FOR
                                PERSONS
                                IN
                                (GET.VALUES THISUNIT
                                    'MEMBERS.OF.ORG
                                    'VALUE
                                    'OWN)
                                COLLECT
                                (GET.VALUES PERSONS
                                    'REALIZATION.OF.POTENTIAL
                                    'VALUE
                                    'OWN)
                                ))
    ))
  )

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ENTIAL

'VALUE
'OWN)))

(LOOP FOR
SUBORGS
IN
(GET.VALUES THISUNIT 'SUBORDINATE.ORGs 'VAL

UE 'OWN)

COLLECT
(GET.VALUE SUBORGS
'REALIZATION.OF.POTENTIAL
'VALUE
'OWN))))))

(DEFUN |CONSULTANT>ORG.PERFORMANCE.CALC:Z.OVERALL.PERFORM.CALC!method| (THISUNIT
)

(PUT.VALUE THISUNIT
'OVERALL.PERFORMANCE
(AVERAGE.OF (LIST (AVERAGE.OF (LOOP FOR
PERFORMANCE.MEASURE
IN
(GET.VALUES THISUNIT
'PERFORMANCE.WEIGHT

S

'VALUE
'OWN)

COLLECT
(GET.VALUE THISUNIT
PERFORMANCE.MEASURE
'VALUE
'OWN)))

(LOOP FOR
SUBORGS
IN
(GET.VALUES THISUNIT 'SUBORDINATE.ORGs 'VAL

UE 'OWN)

COLLECT
(GET.VALUE SUBORGS 'OVERALL.PERFORMANCE 'VA

LUE 'OWN))))))

(DEFUN |CONSULTANT>ORG.PERFORMANCE.CALC:ACHIEVEMENT.CALC!method| (THISUNIT)
(PUT.VALUE THISUNIT

'ACHIEVEMENT
(AVERAGE.OF (LIST (AVERAGE.OF (LOOP FOR
PERSONS
IN
(GET.VALUES THISUNIT
'MEMBERS.OF.ORG
'VALUE
'OWN)

COLLECT
(GET.VALUES PERSONS
'ACHIEVEMENT
'VALUE
'OWN)))

(LOOP FOR
SUBORGS
IN
(GET.VALUES THISUNIT 'SUBORDINATE.ORGs 'VAL

UE 'OWN)

COLLECT
(GET.VALUE SUBORGS 'ACHIEVEMENT 'VALUE 'OWN

))))))

(DEFUN |CONSULTANT>ORG.PERFORMANCE.CALC:SELF.REALIZATION.CALC!method| (THISUNIT)
(PUT.VALUE THISUNIT

'SELF.REALIZATION

```

(AVERAGE OF (LIST (AVERAGE OF (LOOP FOR
                                PERSONS
                                IN
                                (GET VALUES THISUNIT
                                    'MEMBERS OF ORG
                                    'VALUE
                                    'OWN)
                                COLLECT
                                (GET VALUES PERSONS
                                    'SELF REALIZATION
                                    'VALUE
                                    'OWN)))
            (LOOP FOR
              SUBORGS
              IN
              (GET VALUES THISUNIT 'SUBORDINATE ORGS 'VAL
UE 'OWN)
              COLLECT
              (GET VALUE SUBORGS 'SELF REALIZATION 'VALUE
'OWN))))))
(DEFUN |CONSULTANT>ORG.PERFORMANCE.CALC:JOB.SATISFACTION.CALC!method| (THISUNIT)
  (PUT VALUE THISUNIT
    'JOB SATISFACTION
    (AVERAGE OF (LIST (AVERAGE OF (LOOP FOR
                                PERSONS
                                IN
                                (GET VALUES THISUNIT
                                    'MEMBERS OF ORG
                                    'VALUE
                                    'OWN)
                                COLLECT
                                (GET VALUES PERSONS
                                    'JOB SATISFACTION
                                    'VALUE
                                    'OWN)))
            (LOOP FOR
              SUBORGS
              IN
              (GET VALUES THISUNIT 'SUBORDINATE ORGS 'VAL
UE 'OWN)
              COLLECT
              (GET VALUE SUBORGS 'JOB SATISFACTION 'VALUE
'OWN))))))
(DEFUN |CONSULTANT>ORG.PERFORMANCE.CALC:NEED.FULFILLMENT.CALC!method| (THISUNIT)
  (PUT VALUE THISUNIT
    'NEED FULFILLMENT
    (AVERAGE OF
      (LIST (AVERAGE OF (LOOP FOR
                        PERSONS
                        IN
                        (GET VALUES THISUNIT
                            'MEMBERS OF ORG
                            'VALUE
                            'OWN)
                        COLLECT
                        (GET VALUES PERSONS
                            'NEED FULFILLMENT
                            'VALUE
                            'OWN)))
          (LOOP FOR
            SUBORGS
            IN
            (GET VALUES THISUNIT 'SUBORDINATE ORGS 'VALUE 'OWN)
            COLLECT
            (GET VALUE SUBORGS 'NEED FULFILLMENT 'VALUE 'OWN))))))

```

VITA

James Richard Holt [REDACTED]

PII Redacted

His formal education includes a B.S. (1972) in Mechanical Engineering from Utah State University and an M.S. (1978) in Facilities Management from the Air Force Institute of Technology. He was commissioned an officer in the U.S. Air Force in 1972 and has served as a base civil engineering officer in Colorado, Alabama, South Korea, Ohio, West Germany, Utah and Texas. He is now a Major assigned to the Graduate Engineering Management Department, School of Systems and Logistics, Air University. His professional military education includes Squadron Officers School, Air Command and Staff College and many technical engineering courses. He married Suzanne Hatch of Ogden, Utah in 1971 and they have five children ages 14, 12, 8, 6 and 3. [REDACTED] [REDACTED]
[REDACTED] [REDACTED]

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